

KENYA CASEBOOK

Some Fauna of East Africa

Arthur Loveridge

Kenya Casebook

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Edited by:
John M Loveridge

Kenya Casebook

In appreciation of the labours
of my brother naturalists
whom I have plundered,
this book is
gratefully dedicated.

Kenya Casebook

CONTENTS

Introduction	6
Foreword	9
1 Of mythical beasts	11
2 Of baboons, pottos, bats, parasites and flying squirrels	18
3 Of elephants	25
4 Of antelopes	31
5 Of servals, aardvarks, warthogs and giant pigs	36
6 The diverse diets of some birds of prey	42
7 Of hammerkops, hadadas and flamingos	48
8 Crowned cranes and plucky plovers	55
9 Saliva as a building asset	60
10 Of honey guides, kingfishers, whydahs and cuckoos	66
11 Colossal crocodiles and spitting cobras	72
12 Tortoises and their diet	78
13 The lungfish of Lake Victoria and the fishing industry	81
14 Fish that live in sodawater and immigrant fish	87
15 Some saltwater fish and their foes	94
16 Raiding ants and mimicking spiders	100
17 Of wasps and their prey	105
18 Akamba apiculture	110
Postscript	116
List of contributors	118
Bibliography	120

ILLUSTRATIONS ¹

Arthur Loveridge in the 1920s	8
Arthur Loveridge on 29/10/1914	12
Arthur Loveridge at Kilosa in 1921	22
Arthur Loveridge on 25/12/1933	80
Akamba beehives	111
Arthur and “Queenie” Loveridge in 1957	132

¹ Other photographs appear in Arthur Loveridge’s published books (see the Bibliography). (Editor’s note)

INTRODUCTION

This book was written by my great-uncle, Arthur Loveridge (1891 – 1980) in 1957 just before his retirement from Harvard University, Cambridge, Massachusetts, USA; he had been recruited by that institution in 1924 as Associate in Herpetology; later to be Curator at the Museum of Comparative Zoology and then Professor of Herpetology - he remained at Harvard until his retirement. The period of the 1910s, 1920s and 1930s is covered by this book; at this time the author was living in Kenya and Tanganyika Territory or was later leading, on behalf of Harvard University, explorative safaris in Kenya, Tanganyika and Uganda.

To quote a note written by him and found with the manuscript:

“Typescript of ‘They Said They Saw it’. A few months prior to my retirement from the United States in 1957, regretfully having to part with the complete set of bound volumes of the East Africa and Uganda Natural History Society’s Journals, I extracted that which – to me – were the most interesting and informative natural history articles and rewrote them more uniformly to constitute a book with the above title.

However, on submitting the typescript to Harper Brothers, New York and the Lutterworth Press, London it was rejected on the grounds of its appeal being too local, the former adding ‘and scarcely a book’.

A Loveridge”

At this point I have to confess that I changed the title of the book from ‘They Said They Saw It’, as will have been seen, to the present one for the following three reasons:

- to give an immediate idea of the content of the book
- to fit in with the pattern of Arthur Loveridge’s two previous books, ie Forest Safari and Tanganyika Telltale (as well as his brother Moss Loveridge’s book Panama Padre)
- to facilitate internet searches.

To understand the context of this book and the character of its author, one should refer in particular to the author’s previously published books which are listed at the end of this work.

To set the background to this book, the following is an outline of the career of Arthur Loveridge. He was born on 28 May 1891 in Llandaff, near Cardiff, South Wales, the youngest son of Thomas and Alice Mary Loveridge. Some of his siblings also travelled: his brother Moss spent twenty years in Panama as a missionary, his sister Daisy lived in Sian Fu, Shensi, northern China where she worked as a medical missionary for some years, his brother Ernest lived and worked in New York City for several years and his brother Alec travelled widely in Europe for business and travelled to Tahiti, New Zealand and Australia for health reasons – all this in the early part of the twentieth century. Arthur Loveridge, and those of his siblings who travelled, were also linguists; all learned the languages of the countries that they visited (Alec Loveridge even spoke Norwegian and Tahitian amongst other languages); the author quickly learned, unlike his colleagues in Kenya and

Kenya Casebook

Tanganyika, Swahili.

At the age of 21 the first job of Arthur Loveridge was in the herpetological section of the University of Manchester; this was followed in 1912 by two years in the National Museum of Wales. He went to Africa in 1914 to take up the post of Curator of the British East Africa Museum, Nairobi (now the National Museum of Kenya, and headed by Richard Leakey in later times). He stayed there until 1921 but from 1915 to 1919 (during World War I) he saw active service, with the rank of Lieutenant, with the East African Mounted Rifles and served as personal despatch rider to General JC Smuts; however Arthur Loveridge excelled himself as the regimental snake catcher. The period 1920 – 1923, saw Arthur Loveridge as Assistant Game Warden, Game Preservation Department, Tanganyika. As stated above, from 1924 to 1957 Arthur Loveridge worked for Harvard University where he became the world's leading expert on African snakes (see "Leakey's Luck" page 36) and from where he conducted five 12-month long expeditions to Africa during which he collected 8,469 specimens of reptiles and 11,597 specimens of cobras. He retired in June 1957 to St Helena Island, South Atlantic where he died on 16 February 1980 at the General Hospital, Jamestown. In his lifetime he had published five books, some 230 articles including 189 herpetological papers and he had discovered, described and named numerous species.

John Loveridge
Brighton BN2 7AH, England; October 2015

Kenya Casebook



Arthur Loveridge in the 1920s

FOREWORD

Were it not for the fact that lengthy book titles are anathema to publishers, I would have been tempted to add as a subtitle the words “For Naturalists Only”. Having second thoughts, however, it occurred to me that at least some of the underprivileged millions of non-naturalists may be just a little curious as to what it is that their fellow mammals find so enthralling.

“They said they saw it” and I believe them but repeating what they said here, is not quite the same as agreeing with their interpretations of what they saw. How I came to be relaying these stories is easily explained. Recently a visiting professor to Harvard University delivered a lecture on certain attributes of wild animals but, unhappily, I did not hear about it until the following day when some of my colleagues were discussing its content. Apparently Dr WC Allee had stated that it a relatively rare occurrence for one animal to go to the assistance of another. I remarked to my colleagues that when I was at Game Department Headquarters in Kilosa, Tanganyika Territory,¹ a local resident named Kostellesky shot a big baboon on the hill behind the tiny township and as Carl Kostellesky approached the mortally wounded animal, another baboon dashed up, took the injured creature on its back – although it was almost as large as itself – and started downhill. Kostellesky gave a shout that caused his neighbour, Captain Turnley, to run into the garden just in time to meet the baboons on the path; the rescuer, fearing for its own safety, dropped its burden and fled. Being interested, I questioned both Kostellesky and Turnley about the incident.

To my colleagues I also said that in the Journal of the East Africa Natural History Society I had read of both elephant and buffalo helping wounded companions to get away and these comments were repeated to Dr Allee who requested that I furnish references to the incidents of ungulates succouring their companions. A simple matter, I thought, for at home I had a complete set of the Journal and would only have to refer to the index, published in 1944, to find the required details. The elephant incident was soon located but page after page was turned in a vain search for the account of how one buffalo assisted a seriously wounded member of the herd to get away. Though confident that memory had not played me false, I had to admit failure; however, unwilling to accept defeat, I returned to the task a few weeks later and settled down to a search of the earlier volumes, for my recollection was that I had read the account prior to 1914 or 1915. And so it proved, but during the search I was so thrilled by coming across dimly-remembered or wholly-forgotten articles and observations that I wanted to share them with anyone who would listen! How unfortunate that so much of interest should lie buried and forgotten! Then it occurred to me that in 1959 the East Africa Natural History Society would be celebrating its fiftieth anniversary; to mark the occasion why should not I, the Society’s first curator of what was then known as The Nairobi Museum, select from its Journal the observations of a more general appeal to naturalists, and rewrite, condense and summarize them in a single volume.

A glance at the table of contents of this book will show what I believe is most likely to be of interest, first hand records by residents in a region whose wealth of wild life is proverbial and a list of these

¹ See “Tanganyika Telltale” by Arthur Loveridge. (Editor’s note)

Kenya Casebook

contributors to the Journal and, I trust, to your enjoyment will be found at the end of this work. It has seemed advisable to supply, or bring up to date, the scientific names by which the animals are currently known; for this I accept full responsibility. In presenting what they said in a uniform fashion I have taken care not to add to what they wrote except in the form of footnotes or brief introductions to creatures whose appearance the author has assumed to be too well known to require describing. If, despite the exercise of care, some unwitting deviation has given offense, I ask for forgiveness. Except in providing data to differentiate the long-confused green and black mambas, I have not drawn on my own contributions to the Journal.

Chapter 1

OF MYTHICAL BEASTS

Unquestionably the lure of the unknown still exercises a fascination for most of mankind. If a Loch Ness Monster can intrigue sophisticated Scots in the 1940s or an Abominable Snowman the rest of us in the 1950s, one can scarcely blame Kenya's pioneer settlers for speculating about strange footprints or repeating the tittle-tattle of imaginative Africans half a century earlier. Nor should we forget that at the turn of the century the interior of East Africa, now known as Kenya Colony, was virgin territory for the white man though long inhabited by warring tribesmen. In 1891¹ when the Reverend AB Fisher walked up from the coast to Uganda, he said that there were not more than half a dozen white men in the country.

One of the most intriguing of these mystery creatures commenced its depredations a few months after the 1918 armistice; upon my return from the former German East Africa I was invited by the principal sufferer to visit her farm and solve the mystery by tracking down the fabled beast but unfortunately other obligations prevented my visit and within a week or two the mystery had been resolved. It began with the disappearance of ten sheep on the farm of Miss Cara Buxton to whose account (1919:15:498) I am indebted for particulars. Eventually the sheep were found, seven of them dead and three still living; the dead bodies were untouched but the brains of all had been removed through quite small holes; during the next ten days 57 goats and sheep had been attacked and mutilated in the same way and thirteen of the poor creatures were still alive when found. The Lumbwa, who were all terrified by this visitation, said it was the work of a gadget, a name signifying "brain-eater"; the tribesmen alleged that this beast walked on its hind legs, carried off babies from huts and had killed a man. In view of their fears it was much to their credit that they banded together, tracked it to a ravine and, there, speared it to death. The animal was nothing but a very large spotted hyena (*Crocuta crocuta germinans*), possibly suffering from mental aberration suggested Miss Buxton. To which I would add that an abscessed jaw, or other dental defect, making it difficult to use any but the front teeth, might be taken into consideration.

Strange behaviour on the part of wild animals frequently results from some misadventure. A correspondent, who modestly signs himself as "B" (1928:33/34:68) reported from Naivasha that one of his calves was mauled in July 1927; it had been severely bitten but showed no signs of claw marks. What had attacked it remained a mystery until the following September when someone shot a well-nourished, full-grown hyena; a photograph of this animal was published with B's letter. The hyena was completely toeless, most of its pads were gone too and the right hind foot was altogether lost, exposing several inches of the leg bone which had become smooth with wear. B recalled that in early June the hut of a Kikuyu caught fire, going up in flames together with a nearby bed of papyrus; the more or less damp papyrus bed continued to smoulder for weeks. Perhaps, from among the ashes, the charred remains of some dead creature emitted an odour of decay that was

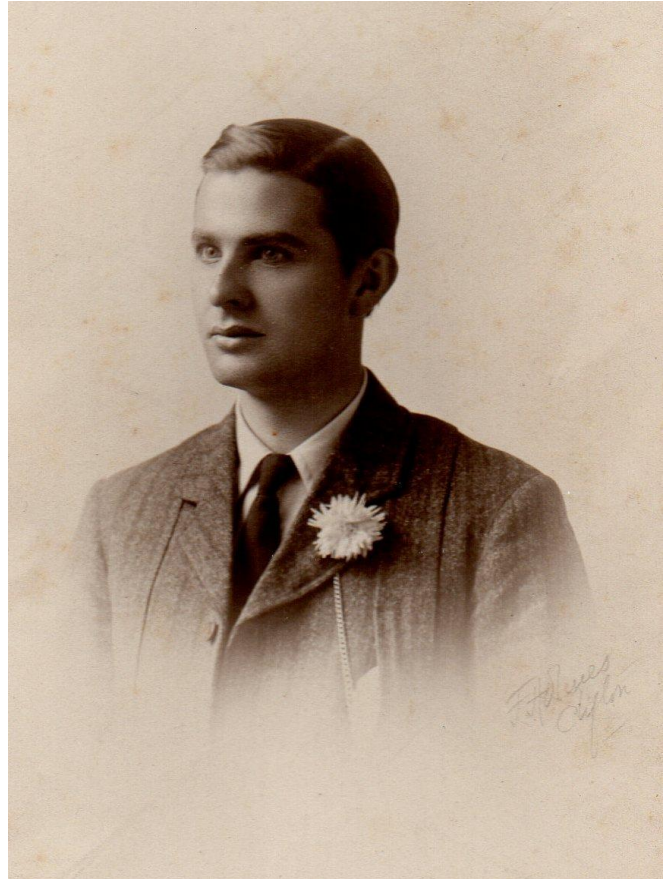
¹ The year when the author was born. (Editor's Note)

Kenya Casebook

irresistible to the nostrils of a hungry hyena; when the venturesome scavenger trotted in the ashes, his weight may well have broken through to a smouldering layer beneath so that his toes got burnt. Startled, perhaps, the animal became panicky and started to run, the floundering effort making matters worse. During succeeding weeks the dead tissues of its injured feet would have flaked away and that the poor brute overcame its disability sufficiently to be in good condition when found suggests that among hyenas the urge of hunger apparently outweighs feelings of pain to a degree unknown in human beings.

Whenever domestic animals are killed in some unusual manner, it is customary for an African to lay the blame at the jaws of some legendary beast, or combination of beasts, assigning to it such attributes as the lively imaginations of his fellow tribesmen may suggest. In fairness it should be remembered that none of Kenya's inland tribes ever developed a written language.¹

Geoffrey Williams, writing in 1912 (4:123) with admitted diffidence, told of an experience he had had on the Uasin Gishu Plateau prior to any white settlement there; this was shortly after the Nandi Expedition of 1905 when he and his cousin were camping near Mataye on the edge of the escarpment. When they left camp en route to Sirgoit Rock everything was enveloped in thick mist and, as they approached the hill, Williams, his cousin and their gunbearer were well ahead of the bearers. Suddenly the mist lifted and simultaneously the cousin exclaimed, "What is that?" Looking in the direction to which his cousin was pointing, Williams saw a large animal seated on its haunches in the attitude adopted by a captive bear when begging for buns. Though not more thirty yards away it was difficult to estimate its height but it seemed to both white men that the creature was nearly, if not quite, as large as themselves, certainly almost five feet high. Before there was time to do anything, the beast dropped forward and shambled away with what the cousin described as a sideways canter. It was in full view for the grass had been burnt off a few weeks before. As it was about to disappear among the rocks Williams seized his rifle from the gunboy and took a snap shot at the animal; he missed, whereupon the beast stopped and looked back at them. It was in this position that Williams best remembers its appearance, for the creature was then seen clearly against the rocks. It seemed to be larger than, and quite as heavily built as, the bears in the pit at the London Zoological Gardens; the head



Arthur Loveridge, aged 23, on 29/10/1914 a few months after his appointment as Curator to the East Africa and Uganda Natural History Museum in Nairobi, Kenya.

¹ However, Swahili, which was originally the language of the coastal areas and which the author spoke, had existed in Arabic script since the 18th century. (Editor's note)

was long and pointed like that of a bear, ears and tail were very small but neither left a clear impression on his memory. The forequarters, indeed all four legs, were very thickly furred, but the hind quarters were relatively smooth, a distinction that struck both observers. The colour was dark, possibly more or less of a brindle, though this effect may have resulted from the light at that time. The animal made off before a cartridge could be procured for a second shot and the ground was too dry, hard and stony to reveal its tracks. Several weeks later the gunboy was given a natural history book with illustrations of the principal animals of the world and told to select the picture most resembling the creature that he had seen on the Uasin Gishu. After a time he stopped at the picture of a brown bear and said that that was the animal.

After Europeans began to settle on the Uasin Gishu, one of them, named Major Toulson, was asked by some Dutchmen if he could identify a strange animal that they had seen on the Plateau. When encountered by them at dusk it had turned on their dogs and chased them away; they described it¹ as a thickset bearlike beast with a peculiar moaning cry. A few days later Toulson was told by his African servant that there was a leopard close to the kitchen – usually an outbuilding built at a short distance from the house. Toulson rushed out and saw a strange beast making off through the gathering dusk; as far as he could see it was about 19 inches at the shoulder which was lower than the seemingly long-haired hindquarters. Its gate was a shuffling walk “similar to that of a bear” and the animal appeared to be black; Toulson could not see its head as it was “nearly dark at the time”.

In March 1913 NEF Corbett Esq, then District Commissioner of Eldoret, picknicked just below Toulson’s farm; having finished his lunch he made his way along the wooded banks of the Sirgoit River, intent on fishing, when he unexpectedly came on what he believed to be the same beast. Apparently the animal was engaged in drinking from the stream directly below him and only a few yards away; the spot was heavily overgrown and Corbett heard the animal shamle through the water and enter the bush on the farther side. Unfortunately being without his spectacles, Corbett did not obtain a clear view but felt confident that the animal was unlike any that he had ever seen being rather bigger than a hyena, it did not appear to be very heavily built and was rather long from hock to heel. A good view of the head was unobtainable but the ears were largish and the body was covered with thick reddish brown hair with “a slight streak of white down the hindquarters”. With nothing but a fishing rod in his hand, Corbett felt chagrined for, scarcely half an hour before, gun in hand, he had passed the spot while looking for a duck. Elsewhere, at approximately the same time – 12.30 midday, a similar animal had been seen by a Mr Kennet. Geoffrey Williams, the first to report the presence of a strange beast on the Uasin Gishu, decided that the animal that he had encountered tallied well with Nandi descriptions of a chemosit, alias chimiset or Nandi bear. Handing to a Nandi a copy of Rudyard Kipling’s “Jungle Book”, Williams asked the man if any of the animals depicted in the large illustrations resembled the creature his fellow tribesmen called a chemosit. The man promptly singled out a picture of Baloo, the Indian bear, as being most like it.

Bears, however, are unknown in equatorial Africa for they do not belong to the Ethiopian fauna. Crowther’s bear (*Ursos arctos crowtheri*), the sole representative of the group in the entire continent, was described from the Atlas Mountains of Morocco whose fauna is largely palearctic. But was Williams correct in thinking that the beast that he had seen was a chemosit? So far as I can judge, the best definition of the latter is contained in a letter from O. Orchardson (1927:28:23) who prefaced his remarks by saying that for sixteen years he had lived among the Kipsigis (Lumbwa), liking and respecting them, accepting their hospitality and reaching a degree of intimacy with them rarely obtained by a European. Orchardson stated that the name chemosit – like that of their chief witch

¹ CW Hobley (1913:6:48)

doctor – must not be mentioned at night time by a Kipsigis; instead he would use the substitute name of gononet. On the other hand the name is employed by mothers to induce obedience among their offspring; for example a child who is reluctant to eat its food will be warned that “the chemosit will come and eat you” if it fails to comply. Yet Orchardson could find no evidence that the chemosit was regarded as a devil, god, spirit or man; on the contrary even those natives who say that the creature has only one leg, claim that it has no arms and insist that it is an animal with a footprint intermediate between those of an elephant and a rhinoceros. The only resemblance to a man, say the Kipsigis, is when, seen from afar, it stands on its hind legs; only a few old men claim to have seen a chemosit and then only at night. Their vague descriptions include fur and wawechnik, a word connoting animal whiskers or insect antennae only; the younger men all deny having seen a chemosit or knowing what it looks like yet they enjoy romancing about it to children or to unsophisticated Europeans.

None of us who knew him would class A. Blayney Percival among the latter. Percival, a naturalist and former Game Warden in the Colony, pointed out (1914:8:127) that descriptions of the chemosit differ considerably, agreeing only as to its being a nocturnal beast of fairly large size that occasionally stands up on its hind legs. Allegedly very fierce it will kill both man and animals; one in the Maraquet District became such a menace, Percival had been told, that a dummy man was placed in the doorway of a hut and within the hut a group of hunters sat and waited until the creature attempted to seize the dummy. Then a flight of arrows put an end to its depredations; this incident allegedly occurred a short while before the First World War. After investigating sundry tales of unknown beasts, Percival concluded that the animals might well have been recognised had the observer been a competent naturalist who would have instinctively looked for characteristics of importance; but frankly sceptical, Percival was the first to suggest that several entirely different animals might be involved in the various reports coming in from the scattered parts of the country. By way of illustration he cited the case of a weird creature that had been seen in the Sotik country. The description was not dissimilar to that of the chemosit for the beast was allegedly very savage and might stand on its hind legs; as for size, the informant pointed to Percival's own pointer dog. Careful enquiry elicited the pertinent information that the animal was light on the back and black on the belly; that alone was sufficient to clinch it and the matter was settled to the entire satisfaction of the observer when he was shown a picture of an East African ratel (*Mellivora capensis sagulata*). Ratels, or honey badgers as they are sometimes called, are unique among African animals in their colouring being the reverse of the normal arrangement. In size and appearance somewhat similar to its relative the European badger, a ratel is a tough and fearless beast of omnivorous habits, preying on any bird or beast that it can overcome with its powerful talon-like claws which also prove serviceable for tearing open bees' nests when in search of honey while the extraordinarily tough hide of a ratel enables it to ignore the stings of the indignant insects.

In my Nairobi days I frequently met a powerfully built young fellow, newly arrived in the country, who had some work in the town; on Saturdays and Sundays it was his custom to tie a rifle to the bar of his cycle and pedal off to the surrounding plains. In the late afternoon, his hands covered with dried blood, he would return, hot, dusty and perspiring with the eviscerated carcass of some little antelope – usually a Thomson's gazelle (*Gazelle t. thomsonii*) lashed to the machine. Around the pair, scarcely distinguishing between the living and the dead, a cloud of delighted flies danced and buzzed. I never could understand the fellow's choice of butchery as an occupation for leisure hours, nor could I succeed in dissuading him; unquestionably he derived much satisfaction from these hunting exploits and was always ready to recount the events of the day to anyone who would listen. On one occasion he returned greatly excited, declaring that he had been cycling along a native path when a bear or gorilla burst from the undergrowth and crossed the track quite close to him; I could

not accept his identifications and I pointed out that there were no gorillas nearer than the Central Lakes region while bears were even more remote. What he had seen, I said, was an old male baboon but he averred that he knew a baboon when he saw one and that the animal that he had encountered was a much larger beast; days afterwards he was still repeating his yarn about a gorilla. Many people are unaware that more than one species of baboon occurs in East Africa; probably the most famous kind is the common yellow baboon (*Papio c. cynocephalus*), sometimes known as the dog-headed baboon – this is the animal that, in many localities, is a real scourge of the natives whose gardens it raids. There is, however, usually associated with rocky hills and outcrops, a much more powerful baboon whose grizzled olive and brown hairs are tipped with black; when seen silhouetted atop some rocky pinnacle, or wandering about a road with the sun rising behind them, these anubis baboons appear quite black and even larger than they really are. In East Africa there are said to be four recognisable races, all of which I have collected for study purposes. With one form (*Papio anubis neumanni*) I had an experience¹ very similar to that of the Nairobi hunter.

At the time I was cycling silently and swiftly along a tortuous native path that wound through the belt of dense thornbush blanketing so much of the country in the vicinity of Kilimatinde, central Tanganyika Territory; rounding a bend I suddenly came upon a great shaggy baboon which, for a fleeting second, I thought must be something else. Then it made off at top speed, loping along the path ahead of me with occasional backward glances after the manner of its kind; I imagine that it held to the path as the thornscrub which hemmed us in was too dense to penetrate. For my part, having a respect for its formidable canines, I was careful not to press it too hard, being uncertain as to what it might do if overtaken. So, for a hundred yards or more, on we went until a gap or tunnel in the wall of thorn permitted it to break away.

For Geoffrey William's excellent description of the beast he saw near Sirgoit Rock on the Uasin Gishu, I would unhesitatingly say it was nothing more than one of the Kenyan races of the same baboon, viz *Papio anubis furax*. It is this baboon which forms the basis of the mythical chemosit, embellished by such attributes of the hyena as the Nandi and Lumbwa may have seen fit to add; however, the animals seen on the Uasin Gishu by the Dutchman, Major Toulson and NEF Corbett, as well as the one killed in a hut in the Maraquet District, were just unusually large spotted hyenas which, in old age, are apt to become over bold and aggressive.

Then from far to the south of the Uasin Gishu, south even of Nairobi, came a carefully detailed account from GW Hickes (1913:6:53), a constructional engineer supervising the building of the Magadi Railway, a branch line to the west of Ulu Station. At approximately 9 am on 8th March 1913 Hickes was travelling by motor trolley at about 25 mph when he saw ahead of him what appeared to be a hyena; it was only some 50 yards away, almost on the track in the vicinity of mile 18 but, having already observed the fast-approaching trolley, it was making off at a right angle to the line. Except for numerous scattered whinstone boulders and the 18 inch high grass rising from the black-cotton soil, the country was open; although the sun was not shining, for it had been raining heavily during the night, visibility was good. That a hyena should be abroad so late in the morning struck Hickes as strange, then, as he passed close to the animal he realised that it was no hyena. The creature had a stumpy nose, very short ears, short neck and short thickset body with high withers; seen broadside on it looked about as high as a lion and very broad across the rump, no tail was noticed. The beast was loping along with both fore and hind legs rising at the same time, as the latter rose out of the grass they were seen to be shaggy right down to the feet which appeared to

¹ See "Tanganyika Telltale" by Arthur Loveridge. (Editor's note)

be large as they were covered with black mud. The creature's long and shaggy hair was a tawny colour like that of a black-maned lion. It did not turn to look at Hickes who could not imagine what it was until he realised that it must be the unknown animal which had been mentioned by various members of the construction party. Hickes' first impulse was to return, for he had a .350 Rigby rifle with him and could still see the animal loping away in the distance; however, remembering that a washaway had been reported from mile 29 and that locomotives could not proceed until he got there, he resisted the temptation. Hickes consoled himself with the thought that he would stop and measure the spoor on his return later in the day but by afternoon it was pouring with rain and much of the region was converted into a marsh, no spoor could have survived the heavy rain. Hickes was disappointed for he had never seen anything like this beast during almost 18 years in projecting railways into the African wilderness – South, West and East. Nevertheless, except for the snub nose, I have little doubt that what he saw was one of the common East African yellow baboons.

Whether, as Editor of the Journal, CW Hobley merely wished to sustain and stimulate interest in the matter or, in view of the discovery of the okapi only a dozen years before, he really hoped to uncover some entirely new creature, I cannot say, but he returned to the subject (1913:7:85). He said that he had been informed by Cumberbatch, District Officer in the Tana region, also by the Assistant District Officer, that the Pokomo of the middle and lower reaches of the river knew of a beast which they called koddolo. One was said to have been killed some years before in the vicinity of Ngao; German missionaries, who had been stationed at Ngao for many years, discovered that the entire population of the largest Pokomo settlement in the Kinakombe district had deserted their village and moved across the river for fear of this animal which had been roaming about in the vicinity of their village. The Pokomo people are not hunters but live by fishing and agricultural pursuits; they are not generally considered as highly strung or imaginative, yet one Pokomo alleged that a koddolo had killed a rhinoceros near Mahere - perhaps the animal had been seen leaving the carcass of a rhino which it was assumed to have killed. Several of them obligingly furnished accounts of the animal which was allegedly very fierce, attacking a man on sight, visiting villages and carrying off sheep. On such occasions the raider might be scared away by the beating of drums, as happened when one attempted to break into a goat kraal the previous January. The Boni hunters of this region, while familiar with the beast, admit that they prefer to leave it alone.

An amalgamation of the various accounts leaves little doubt that a hyena, clothed in exaggerations, forms the basis of the stories; the animal was said to be rather smaller than a lion and another informant estimated its height at the withers as about three and a half feet and the overall length as six feet, of which the four inch wide tail was about 18 inches. Alternatively the tail is "short and very broad". All accounts agree, however, as to the animal possessing a thick mane and long hair which ranges from reddish to yellow; the length of the head was moderate, with longish teeth – though not as long as those of a lion. A koddolo usually "goes on fore¹ legs", which are very stout, but it can travel on its hind legs though it does not climb trees; its claws are very long and the tracks show one deep claw mark behind the level of the others. Despite a few exaggerations, the foregoing description bears a rough resemblance to that of the hyena, but one Pokomo told his District Commissioner that generally speaking a koddolo resembled a huge baboon, as large as man, sometimes walking on four legs and at other times on two. However, he admitted that he had never seen one himself and here again it is the attributes of a local baboon (*Papio anubis ibeanus*) that have become confused with those of a hyena.

More recently (1941:70:57), and with quite a modern touch, the headlights of a car returning to

¹ Surely a misprint for four.

Kenya Casebook

Nanyuki revealed a "Nandi bear" on the Loldaikas Road in the vicinity of Payne's Farm. Under such circumstances one would have expected a hyena but the observer "particularly noted that the body did not fall away to the hindquarters" and the feet were large. Consequently we must again assume that it was a baboon as indeed was another "Nandi bear" killed by the poisoned arrow of a Nrorobe hunter in the same general area, as reported by HK Fell (1942:71/73:138) of Gallway, near Kitale.

Chapter 2

OF BABOONS, POTTOS, BATS, PARASITES AND FLYING SQUIRRELS

Allegations are fairly frequently made by Africans that baboons kidnap their children but authentic cases are uncommon; that such charges have a factual basis is shown by a game ranger's report cited by his chief, AB Percival (1919:14:415). Mr GH Goldfinch, the ranger, wrote that a baboon attempted to carry off a Kikuyu infant while the mother was engaged in gathering firewood on the Hon. RB Cole's property in West Kenya; the plucky woman went to rescue her child but was rather badly bitten on the arm and leg. Goldfinch further stated that at about the same time and place a second child had disappeared and he wondered if it too might have been carried off by a baboon. He speculated as to what a baboon would do with an infant child and suggested that the animal, when tired of its new plaything, would drop it. If, however, the baboon was prompted by unsatisfied maternal instincts, as seemed to be the case with my vervet monkey Jenny and the rat (1922:17:39), the outcome might be very different. Stimulated by Goldfinch's story, GAS Northcote (1921:16:60) wrote that in 1917 a Kikuyu child, severely bitten and scratched by a baboon, had been brought to him for treatment; the mother, wife of a squatter on RFC Thompson's farm, told him that another child had been mauled by the same baboon not long before - in both instances the child had been attacked on the ground and no attempt had been made to carry it off. Northcote concluded by saying that another Kenya game ranger, RE Dent, an eye-witness to the affair, he believed, had told him of a child that had been carried up to a ledge on the face of a precipitous krantz and there abandoned; this infant was eventually recovered unharmed by an African who was lowered on a rope from the top of the cliff. I might add that in February 1923 when I was at Game Headquarters in Tanganyika, Mr Kenney Dillon, then District Officer in charge of Kissaki, reported that baboons had just attacked and killed the infant child of a native woman while she was at work in the fields.

As the cliff rescue of the child occurred in South Africa, the culprit was presumably a form of the chacma baboon (*Papio comatus*). Thus three entirely different species were involved for it was undoubtedly the ubiquitous yellow baboon (*P. c. cynocephalus*) in the Tanganyika incident while the West Kenya attacks were almost certainly carried out by anubis baboons (*P. anubis furax*) which is the big shaggy beast which, as suggested in the previous chapter, the pioneer settlers of Kenya were apt to mistake for a bear.

Today, as a legacy of those expectant times when one was never certain what might turn up next, we find the name of "Nandi bear" applied to a strange, though very different creature; the credit for this genuine discovery goes to Robin Kemp when on a collecting trip for the British Museum. The creature in question was obtained in the Kakamega Forest by a Mr Brett who sent it alive to Maturin of Mumias; Maturin attached a cord to the little beast and allowed it to climb a gum tree to sleep. The following morning it was quite out of reach and when Kemp came along he was told that he could have it. At the time Kemp was en route from Kisumu to Mount Elgon and his porters with their loads were waiting to be off while with every passing moment the sun mounted higher and higher

Kenya Casebook

in the sky; hence regretfully Kemp shot the animal. The queer little creature closely resembled a teddy bear with rather human hands and the merest suggestion of a tail. But for its flattish face and prominent eyes the head was somewhat bullet-shaped and the entire animal was clothed in soft, grey-brown fur, the grizzled effect resulting from some hairs being tipped with black, others with white whilst both throat and belly were entirely greyish white. That night, after making camp midway between Mumias and Kakamega, Kemp prepared the skin and skull for despatch to the British Museum; he later learned that it was the first, and undescribed, eastern form (*Perodicticus potto ibeanus*) of the forest-dwelling potto that ranges from Sierra Leone to the Belgian Congo. When Hobley (1911:2:111) heard of this he asked Brett for information as to the capture of this potto and Brett replied that it had been brought to him by a native who averred that the animal was a young one which he could not have secured had its mother been about. Drawing on his imagination the African had stated that the parental pottos were very fierce and would “throw stones with considerable accuracy at anyone” approaching them. No one seems to have asked where the arboreal and sloth-like potto would procure the stones it threw! Perhaps the man mistook the potto for a young baboon? Anyway Hobley proceeded to suggest that this potto was the origin of the Nandi bear and linked it with tales he had heard of Nandi women being attacked when they went into the forest to gather firewood. The poor little slandered potto which, when fully grown, measures scarcely more than fifteen inches from nose to rump.

Doubtless encouraged by this discovery, the veteran collector in Kenya, HJ Allen Turner, visited the Kakamega Forest in October and November 1913 and it was from Turner (1914:8:124), who succeeded in bringing back some pottos alive, that we first learned of their habits. Most of his specimens were obtained from creeper-draped trees growing at the edge of forest clearings created by the fall of several giant trees; in such spots progress was especially difficult, not only because of the branches and stems of the fallen trees with their luxurious growth of vines, but access to sunlight had encouraged an almost impenetrable growth of nettles. Turner doubted if pottos ever leave the trees voluntarily as their progress on the ground is so awkwardly slow; even when alarmed a potto's movements are very deliberate as it climbs upward or uses its arms to conceal its head. At such times remarkable attitudes may be assumed so that the animal actually appears to be more broad than long but when resting normally, however, the hindquarters are humped up and the head thrust between the forelimbs. In this position the spines on the cervical vertebrae are prominent though they do not penetrate the tough skin, being encased in a series of deep pockets from which they have to be withdrawn when a potto is being skinned. A scattering of long hairs on the head and nape of a potto add to the animal's grotesque appearance. Turner assumes that the creature sleeps with its head towards the tree trunk, possibly relying for protection on the very objectionable output of its scent glands.

A claw is present on the second (not first) toe of each hind foot instead of the flat nail of the other digits and thumbs are large but, as with galagoes, the index finger is rudimentary. A potto's grip is remarkably powerful and Turner found that once an animal had taken hold of something it was difficult to induce it to let go; indeed, such was the strength of his captive potto that, while gripping a vertical stem with its hind feet, the animal could extend horizontally to its full length. As often as not it would hang head downwards while feeding so as to leave the hands free for grasping fruit or other food. Ninety percent of the stomach contents of all pottos preserved by Turner consisted of a sticky white jelly; this semi-fluid substance resembled boiled tapioca in which minute particles of a red-skinned fruit, tiny particles of insects and small fragments of small bird's eggs. It was sometime before Turner discovered that the jelly was acacia gum and, at the time of writing, he had for eight weeks been successfully feeding his potto on gum soaked in water with the addition of just a little banana or other fruit.

Robin Kemp's accidental discovery of the East African potto occurred, as I have said, when he was en route to Mount Elgon to study the fauna of its famous caves; for this task he was well-equipped, having an unquenchable interest in animal life. During his boyhood in Somersetshire, together with an "ardent spirit of similar tastes", he had searched for bats in the limestone caves of the Mendips and these expeditions, spiced by a certain amount of danger, were not very successful as bats are elusive creatures. If a catch of three or four of the squeaking, skinny creatures resulted from small hands being thrust far into cracks and crannies, that was considered ample reward for the youngsters. From Chief Kirui's village, Kemp and his carriers climbed the "unpeopled heights" to a cave that was screened in front by a waterfall and, dancing in its spray, Kemp's bearers leapt from one moss-covered rock to another, laughing and shouting like children to hear their own voices echoed by the cave. Within the cavern Kemp found an abandoned village of thirty rotten huts and, also, the unmistakeable odour of a place long occupied by bats.

So as soon as the men's excitement had subsided Kemp sent one of them to fetch a candle from his baggage; when the fellow returned Kemp led a party into the dim recesses of the cave, cautiously clambering over and up great masses of rock until the last faint glimmer of daylight from the entrance was all but obscured. To test whether he was right in thinking that they had almost reached the rocky ceiling, Kemp tossed up a stone only to find that the roof had receded even higher than they had climbed. On and up they went, moving slowly for the rocks were slippery with accumulated bat droppings. Again they halted and more stones were thrown, disturbing thousands of bats which, with shrill squeaks, took off, their myriad wings fanning the faces of Kemp and his companions and setting in motion the noisome air. The stygian darkness seemed almost accentuated by the solitary candle whose feeble light served only to illuminate the next upward step; for an hour or more, except during intervals in which they groped about to see if any bats had fallen, the party continued with an intermittent bombardment of the black vaults above them. As might be expected, however, such random efforts proved futile. Telling his men to remain where they were, Kemp retraced his steps towards the entrance until there was sufficient light for him to sight his gun; weapon in hand he stood ready to fire should a bat venture within range but, as none came, Kemp shouted to the men to throw more stones and presently some harassed bats flew past and one appeared to hang up on the roof. Hastily Kemp took aim but before he could fire the bat was gone, another fluttered hesitantly about, would it settle? How difficult it was to see in that dim place, the animal paused ... bang! Though masked by the echo of the explosion surely he had heard the faint sound of a falling body? Stepping gingerly, fearful of slipping into the gaping crevices between the boulders, Kemp picked his way to the spot; slowly he passed his hands over the filthy rocks, groping here and there until at last they came into contact with the clammy wings and furry body of a large fruit-bat.

It proved to be a new race (*Rousettus lanosus kemp*) of a mountain-dwelling species, discovered only six years before at 13,000 feet on the Ruwenzori range. Long afterwards (1926) I came across some Kemp's fruit bats in a cave in the Uluguru Mountains of Tanganyika Territory and later (1933) I collected a series at Sipi on the Uganda slopes of Mount Elgon. It is now known to range northwards to the mountains of Ethiopia. There are more than a dozen species of fruit-bat in East Africa, some large enough to merit the name of "flying-fox"; one of these, known as the straw-coloured fruit-bat (*Eidolon helvum*) for its fur is sulphur-yellow, measures two feet six inches across the outstretched wings. These bats congregate in immense numbers of which some idea is furnished by HA Osmaston (1953:94:74); in company with HC Dawkins he was camping near a sawmill in the southern part of Kalinzu Forest, Ankole, Uganda on 8th January 1953 when, shortly before dusk, they observed many bats flying northwards at a height of from one to three hundred

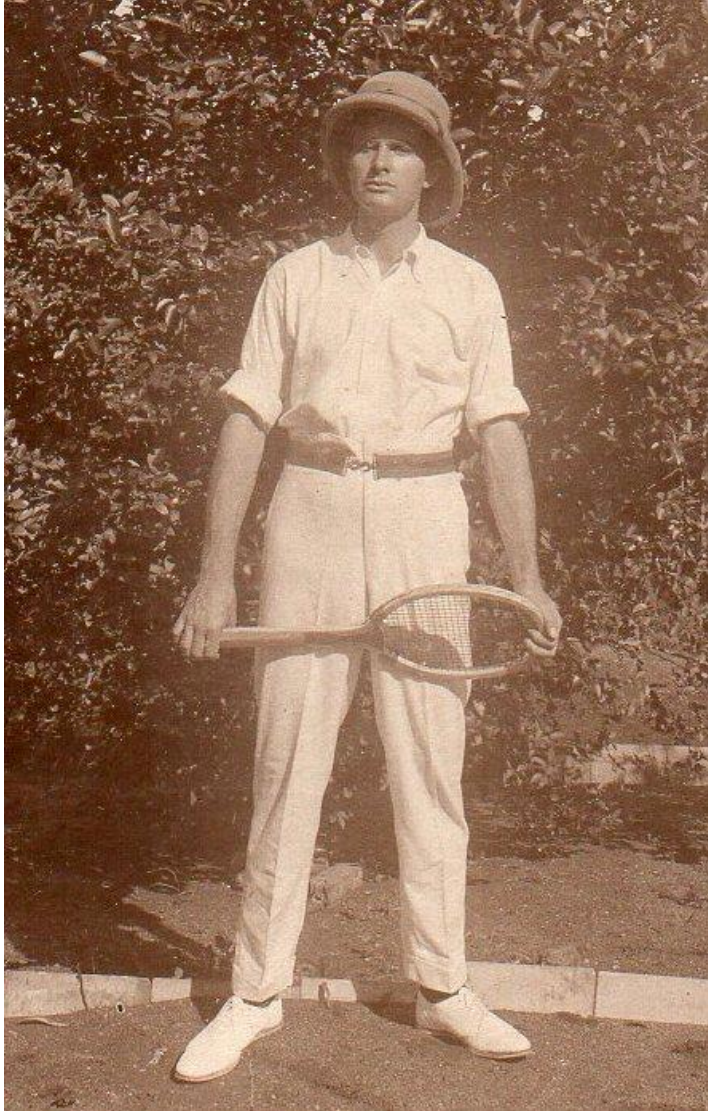
feet above the forest. Whilst most of the bats continued purposefully and steadily on their way, a few weaved among the treetops and half a dozen fluttered round or temporarily settled in a tall *parinari holstii*, the most numerous species of tree in that vicinity. Its fruit, the grey plum, may provide the staple food for such bats that feed in the forest. To the south lay valley forests and partially cultivated grasslands, while northwards beyond the Kalinzu Forest were grassy hills with scattered banana plantations in the valleys until one came to the flats about Lake George.

From about 7.30 until 7.45 pm, when it became too dark to see, the two men counted the bats crossing the half-mile stretch of sky visible. During that time they estimated that more than 10,000 bats streamed past at a rate of about 300 to 400 every minute. That this was no seasonal migration but a regular evening flight, was the conclusion of HA Osmaston for he observed it again a month later when he again spent a night at that place; he assumed that the bats return to their roosts in the dark for one dawn he watched in vain for their coming. Mr Osmaston concluded his note by directing attention to Sir HM Stanley's similar observation at Mabengu Village, near the Ituri River, as recorded in "In Darkest Africa" (1891:1:481).

Dr GJ Jex-Blake discusses (1931:42:179) his abortive attempts to rid his Nairobi garden of Wahlberg's épauletté fruit-bats (*Epomophorus w. wahlbergi*)¹. The animals, whose fur is reddish brown, were attracted by the fruit of some passion flowers (probably *passiflora laurifolia*) which, creeper fashion, were growing over the wire netting surrounding his tennis court. At the time of writing, the plants – being nine or ten years old – formed a wall about eight feet high, possibly eighty feet long and two feet in thickness. As the fruit ripens it turns from a dark bluish green to golden yellow or orange, each pomme d'or being as big as the egg of a hen or even a goose; they are delicious to eat but most of the crop was lost owing to the depredations of the bats which would bite a round hole – the size of a shilling or rather less – in the upper part of the ripening fruit. In 1930 Dr Jex-Blake borrowed a bird-net, which was set up around the creeper, but failed to deter or ensnare the raiders. The following year it was decided to try strychnine of which $\frac{1}{4}$ of a grain was advertised as lethal for a wolf, six for a leopard and twelve for a lion. In order to accustom the bats to eating fruit that, instead of growing naturally on the creeper, were tied around with string, a couple of ripe pomme d'or were fastened to the creeper in this way on 12th October 1931. Next morning the fruit lay on the ground, the restraining string having been bitten through, their stalks bitten off and faint tooth marks visible on their surfaces; it seemed that the bats had been unable to penetrate the skin which is certainly tough and elastic under a knife. Hence, the following night two of the fruit were wired to the creeper in order to hold them securely, furthermore to make matters easier for the bats, a shilling-sized section of rind was cut from the top of each. Availing themselves of these courtesies the bats removed the pulp from the fruit every night from 13th to 16th October and from 17th to 22nd October each of eight pomes d'or was treated with a grain of strychnine hydrochloride, four others with three grains each of potassium cyanide, and nightly two of the doctored fruit were attached to the creeper.

Night after night the entire pulp was consumed but, despite careful searches being made in the vicinity, not a single dead bat was found. The matter was discussed with a chemist who thought it possible that the animals might vomit a lethal dose of salts before it had time to take effect and he further suggested substituting strychnine alkaloid for the hydrochloride. So three and a half grains of the alkaloid were introduced into each of four pomes d'or and the fruit hung up on the evening of 23rd October. During the night the holes that had been cut in the fruit were much enlarged and the contents of three removed (the fourth seems to have been overlooked) and on the ground below

¹ Both the generic and specific names had been mis-spelled in the original article.



*It was not always work in Tanganyika!
Arthur Loveridge at Kilosa in 1921 several months
after his arrival from Kenya to Tanganyika Territory.*

lay considerable debris of both rind and pulp. Beside the poisoned debris on the 24th lay the bodies of two striped mice (presumably *Lemniscomys striatus massaicus*) but no sign of the bats which continued to arrive nightly. The experiment continued, from 17th October to 29th November, until the bats had apparently consumed 59 grains of strychnine alkaloid, 8 grains of strychnine hydrochloride, 12 grains of potassium cyanide, 20 grains of white arsenic and about 6 or 7 grains of corrosive sublimate. As Dr Jex-Blake pointed out this formidable list of poisons was adequate to kill at least fifty men, yet there was no evidence that a single bat had succumbed and the affair remained a mystery.

On Mount Elgon, Kemp (1912:4:116) was continuing his quest for bats, employing various techniques; searching banana plantations and the dim interiors of abandoned huts. Sometimes at sundown he would select a strategic point between a bat roost and the feeding place and, gun in hand, await the arrivals of the animals; at night a silken net might be stretched between two forest trees where bats were accustomed to fly to and fro. The most rewarding method numerically, though the least discriminating, was to offer a bounty to natives for every bat brought in; occasionally this resulted in a whole basketful of the creatures. For the conscientious collector such an offering meant many hours of painstaking work,

taking measurements and entering them on a label together with other pertinent data as to place and time, skinning, stuffing and finally arranging the specimen with neatly folded wings to dry. Kemp remarked that about one thousand forms of bats have been described in detail which includes measurements of their skulls, peculiarities of teeth – which range in number from 20 to 38 – colour of fur and so forth, not to mention habits, food and parasites. “What is the purpose of all this?” demands Kemp, “What good accrues from so much effort?” And the answer he supplies is ... “Because of a thirst for information which will never be assuaged.”

So we read on and find GHE Hopkins (1939:14:180), the entomologist, accompanied by THE Jackson, who, with an urge to know more of bat parasites, also paid a visit to one of the Elgon

caves. Profiting from modern discoveries they carried an electric torch the beam of which revealed several hundred bats thickly clustered on the natural dome where an area of about one yard in circumference was completely covered by the animals. When a stick was tossed up the host scattered, abandoning a seething mass of pink and hairless youngsters still clinging to the rock; these naked offspring were soon covered over again by the returning adults and Jackson wondered whether such a "nursery" had ever before been observed by others. The small dark bats of this colony were of a race (*Miniopterus natalensis arenarius*) first described from the Guaso Nyuki near the Northern Guaso Nyiro. Messrs Hopkins and Jackson felt amply compensated by finding many different species of fleas, mites and dipterous parasites on the bats they preserved. Parasites in East Africa continue to provide plenty of scope for original research and speculation; for example JK Creighton (1913:7:81) declared that when his boys were skinning a porcupine they were attacked by mites which caused sharp pain resembling a wasp sting rather than a bite. However, the irritation lasted only a short time, caused no swelling and left no permanent effect so far as Creighton could see. In June 1912 he sent some of the mites to the British Museum and was told by Stanley Hirst that they represented an undescribed species of *Leiognathus* of the family Gamasidae, being characterised by a curious hook-like structure on the coxae of the second pair of legs. Hirst went on to say that he had only once heard of a Gamasid mite attacking a human being and that was when a woman who had been severely bitten by mites (*Laelaps agilis*) of a species that normally lives on rats; the bites allegedly gave rise to a fever. Creighton's note is accompanied by a microphotograph of the porcupine mite.

I venture to think that a misunderstanding may have occurred when Creighton's skimmers were reporting the matter and that the painful bites that they suffered were due to the enormous and elusive porcupine fleas (*Periodontis riggenbachii*) which dwell among the forest of quills where they are free from molestation by their host; under these conditions small size is of no particular advantage and, consequently, porcupine fleas grow to twice the size of cat and dog fleas whose days are spent under precarious conditions with accompanying nerve strain! But the big fellows were not choosy and, though porcupines were their normal hosts, they transferred themselves and their attentions to my skimmers, much to my men's discomfort.

Apt to be mistaken for a parasite is a reddish brown insect (*Hemimerus*) that lives among the fur of giant rats (*Cricetomys*); actually the insect is there in the role of a groom, feeding upon, instead of brushing off, the particles of the rat's scarf skin. Cockroaches are perhaps the insect's nearest relations but *Hemimerus* is viviparous, a rather unusual state of affairs among the orthopteran. It is the Editor of the Journal who records (1912:4:131) the killing in the Provisional Commissioner's garden at Nairobi of a giant rat (*C. gambianus kenyensis*) in whose fur was a hemimerid; he calls it *H. talpoides* but that is a West African species and at Nairobi it was more probably an example of *H. vosseleri*, later described in 1936 from Kenya by Rehn. Except that the posterior half of their sparsely furred tail is white, these giant rats resemble an ordinary house rat but they are not to be confused with the robust maned rat (*Lophiomys ibeanus*), an arboreal species with a relatively short, thickly furred tail. GH Goldfinch (1912:4:126), whose article is accompanied by a photograph of the mounted specimen in the Coryndon Museum, says that the maned rat is fairly common in the Mau and Subugo Loldian Forests.

The Dorobu hunters call them eminget and believe their bite to be fatal, a legend which may have arisen, suggested Goldfinch, in the remote past when a bitten tribesman succumbed to blood-poisoning; they allege that maned rats live in pairs in hollow trees, especially junipers, and if one is captured in such a hole its mate is likely to be found in the same hole on the following day. When alarmed, these rats do not appear to emit any cry but make a peculiar clicking noise with their teeth.

Kenya Casebook

In captivity, they will eat almost any kind of greenery, their diet being exclusively vegetarian; litters apparently consist of two and the fur of the newly born young being silver grey except for a naked line along both flanks.

Another arboreal resident, but whose fur is smoky grey, is Jackson's flying squirrel (*Anomalurus j. jacksoni*) which was seen in the Kakamega Forest by HJ Allen Turner (1914:8:126) who stated that these very large squirrels are diurnal but are so timid that they would never glide across forest clearings when there is anybody about. Their "flights" – actually planing on the skin expansions connecting fore and hind limbs – may extend to as much as 150 yards and they invariably alight on the well-exposed, perpendicular lower part of a tree trunk. Each squirrel lands with its legs well extended, the scaly scutes on the underside of the tail assisting the feet in getting a secure grip; then, if alarmed, the animal seeks refuge on one of the larger branches where it flattens out "with limbs and flying membranes extended", its colour helping to render it inconspicuous. One such squirrel had taken refuge in a hollow tree and Turner found it extremely difficult to dislodge; to do so a native had to climb the tree. The stomach contents of the flying squirrels preserved by Turner apparently consisted entirely of leaves but so well masticated that certainty of identification was next to impossible.

Chapter 3

OF ELEPHANTS

About the year 1911 Monsieur Le Petit, having spent five years in the French Congo, arrived in Nairobi and so impressed RJ Cuninghame, the well-known hunter-naturalist, with his report of a tapir-like water elephant that Cuninghame communicated Petit's observations to the *Journal* (1912:4:1997). M Le Petit had first observed these animals about June 1907 near the junction of the Congo and Kasai Rivers; the second time was in swampy country between Lakes Tumba and Leopold II, at a point where the latter gives rise to Mfini River, in Lukenye District.

On the first occasion Le Petit was travelling in a dugout when he saw what he supposed was part of a sunken tree – until the boatman told him that it was the head and neck of a water elephant; shortly afterwards the animal submerged. On the second occasion, through his field glasses, Le Petit was able to observe five of the animals for fully a minute; they were on land amongst tall grass about four hundred yards away. So far as Le Petit could see, none of the animals carried tusks and their trunks were only two feet in length; their long and distinctively ovoid heads had ears resembling those of the common African elephant in shape but were considerably smaller, though their necks were thought to be twice the length of that species. Their backs were curved as in the common kind but height at shoulder was not more than six to eight feet, the legs being relatively short. Their weight seemed to be largely carried by the toes, judging from the footprints left on level sandy soil which showed four clearly separated toes, as with hippopotamus spoor, while the plantar portion of the sole was less pronounced. Their gait, observed as the five animals plunged into the lake, was elephantine but the dark hides appeared to be hairless, smooth and shiny as the skin of a hippopotamus.

The Babumas, a local tribe of fisherfolk, knew the animal as ndkoko na maji or water elephant; these animals, though not numerous, are allegedly very destructive to the nets and flimsy fishing traps of the natives who say that one will occasionally rise in the water and upset a canoe with its short trunk. The Africans also averred that these elephants, like hippopotamuses, spend the daylight hours in water, emerging after sunset to feed on the rank growth of riverside grasses. Undoubtedly the animals that had been seen by Le Petit were forest elephants (*Loxodonta cyclotis*) as was subsequently pointed out by Dr Glover M Allen¹. The species was first described from the Cameroons in 1900 by Paul Matschie and subsequently redescribed from four different localities in the Congo including Mpaa near Lake Leopold II; its range extends eastward to the southwest corner of Lake Albert but apparently it is very local and nowhere is common. The inconspicuousness of the tusks of the animals seen by Le Petit suggests that they were young, for the forest elephant develops quite long tusks, though more slender than those of the common species. Owing to the

¹ Proceedings of the Academy of Natural Sciences of Philadelphia, 88:23.

Kenya Casebook

annual inundation of their habitats during the rains forest elephants may be a trifle more amphibious than ordinary elephants which have long been known to cross rivers under water, thrusting their trunks, like a periscope, above the surface in order to breathe.

Indeed, CM Dobbs records (1914:8:129) that some time previously three or four elephants crossed the Kavirondo Gulf to Uyomo, in the Kisumu District of Nyanza Province; they accomplished this, according to the natives, by walking along the bottom with their trunks held vertically. About 1911, when elephants in the higher country of Kabwoch and Kaniamkago were being frequently fired upon, a small bull descended to the Ulambwi River and crossed the narrows at Mbita to Lusinga Island. This island is to a great extent desert and offers little cover for so large a mammal as an elephant, so in due course the refugee was shot.

CW Woodhouse (1912:5:64) recounts how three elephants, having been harried in Kisii or South Kavirondo Districts, crossed Lake Victoria at the mouth of Kavirondo Gulf; one turned back, one was so exhausted that it fell victim to the Natives and the third escaped northwards to the swamps of the Yala River. There the refugee made its home in thick scrub by Otodwa Stream near the outlet of which it fed in the bush. From this retreat, which the animal was said never to leave for more than five days at a time, it raided the numerous Native shambas in the vicinity; it caused considerable damage, terrorised the inhabitants of the surrounding villages and its slender tusks were said to project two feet beyond its lips. Having lost all fear of man, said the Natives, this elephant promptly chased anyone that it happened to meet. It is scarcely necessary to say that many people were not over anxious to make its acquaintance but Woodhouse was informed that the surest way of finding the rogue was to venture into the bush near its haunts – when it would promptly charge. As it happens Woodhouse visited the place that was said to be the animal's permanent home on a day when the elephant was away raiding crops on the south bank of the Yala; there African statements appeared to be substantiated, both by the abundance of dung as well as by the broken trees and trampled grass that might well have been caused by a large herd of elephants but actually, north of Kavirondo Gulf there were no other elephants nearer than Elgon Mountain and, possibly, just as far away on the Uganda side.

A mile or two back from the lakeshore in the lowlands of Kisingiri, Nyanza Province, related Dobbs (1914:8:130), a great escarpment rises almost perpendicularly to Upper Gwasi and somewhat to one side of the steepest place there is a track which, after ascending almost to the top, turns off to the right along the precipitous face of the escarpment. At a point where the cliff rises almost sheer on one side and falls away on the other, Dobbs was shown where an elephant had fallen down the cliff. Apparently the animal had been coming from the Gwasi country but on reaching the crest of the hill had missed its footing and had gone tumbling head over heels to the bottom; even three or four years after the accident the course taken by the great pachyderm was clearly marked by a swathe of broken euphorbias and displaced rocks. Some African woodcutters, who had been at work in the vicinity, had heard the noise and found the poor beast's remains, almost reduced to pulp, lying at the foot of the escarpment.

On a Sunday afternoon in 1926 an African forest guard arrived at the home of Mr MFR Hockliffe (1927:28:24) to report the finding of some ivory; in this there was nothing remarkable but when Hockliffe went outside to inspect the ivory he was astonished to see a row of one dozen tusks, the smallest of which weighed only one and a half pounds; all had been recently removed from the elephants that bore them, said to be young bulls. Some weeks elapsed before Hockliffe was able to visit the scene of the tragedy which was about a mile upstream from a fishing camp on the left bank of the Gura River at a point where the sides of the valley are almost precipitous. Down this

Kenya Casebook

steep slope for about two hundred feet was a broad swathe of bare earth and rocks from which all vegetation had been swept away and at the foot of the slope, beneath a tangle of uprooted trees, shrubs and jumbled rocks lay, within a few yards of one another, the carcasses of three elephants whilst a fourth lay one hundred yards away and, in different directions the bodies of two more which had managed to stagger about a quarter of a mile before collapsing. The first four had presumably been killed outright. Though the poor beasts must have encountered many rocks and other obstacles in their fall, curiously enough not a single tusk had been chipped. It was with considerable difficulty that Hockliffe and the guard found a way to climb the steep bank; at the outset a detour had to be made around the lower part which was absolutely precipitous – even so the remainder was unpleasant going due to the scarcity of hand or footholds and to the frequency with which loose rocks and small avalanches of earth kept falling down. Eventually the two men reached a game track following the contour from which the elephants had begun their final and fatal descent. Though by this time the spoor was several weeks old, no signs of fighting or other disturbance could be seen along the track which had not broken away; nor was there any indication that two herds, coming from opposite directions had met. The conclusion, therefore, seemed to be that the animals had ventured off the track to feed and that their combined weight had started a landslide from which they could not save themselves. Alternatively they might have been suddenly scared by a lion or people from the Wanderobo tribe.

One wonders what had scared or caused an elephant to wander up Mount Kenya where its remains were discovered on the northwest slope at an altitude of between 15,000 and 15,300 feet; in January 1944 when the carcass was found by Messrs JH Greenway and MP Taffe (1944:81/82:93:photo), it was lying on a scree where it was supported by a large boulder. It was thought that the elephant had slipped and broken its foreleg while trying to descend and, being unable to rise, had presumably died of exposure; at that altitude snow, except where blown away by strong winds, remains in crevasses even at midday and there is no food for an elephant anywhere nearby. Neither the sex nor age of the animal had been determined for it had been dead for so long that the ears had completely disappeared, only a few inches of the trunk remained and the bones had been picked clean except where covered by the pachyderm's taut hide - doubtless vultures had played a large part in removing the flesh.

Taffe's discovery reminds us that Mackinder reported finding the skeleton of a Cape buffalo (*Syncerus c. caffer*) on the eastern side of Mount Kenya at 14,000 feet. More recently W McGregor Ross (1911:2:63) relates how, on reaching the moraine just below the Joseph Glacier at about 14,500 feet, he came upon the almost intact carcass of a buffalo; there, probably frozen solid, it lay on the boulder-strewn slope, a tawny, khaki-coloured object almost as hard as wood. Except for the eyes having been attacked by birds, it appeared to be intact and uninjured and its horns, along the inside of the curve, measured thirty inches. How this lone animal came to perish in that grey waste of boulders, about 5,000 feet above the usual haunts of its kind, is likely to remain a mystery.

Writing of the elephants on the Uaso Ngishu Plateau, AC Hoey remarked (1910:1:49) that one of the three herds roaming the region the largest numbered about three hundred animals. In April or May of each year at the onset of the big rains these herds make a leisurely migration from Mount Elgon to the Elgeyo Forest, browsing along the banks of the Nzoia River as they go; one certain indication of the recent passage of a herd is the peculiar smell emitted by the stripped bark of the thorn trees that, especially when in bloom, constitute a favourite item in an elephant's diet. The great pachyderms are also particularly fond of a fibrous plant that grows in certain sections of the Elgeyo Forest; apparently it is especially attractive in the middle of the dry season, for it is always at that time that they raid the plants. Sometimes the trek is to a distant salt pan but, whatever the

objective, the tracks showed that the herds made for it with a purposeful directness which greatly impressed Hoey. He estimated that the herds maintained an average speed of between five and six miles per hour when on trek; however, an individual elephant, if chased by a man on horseback, soon tires and can be overtaken. Hoey discovered that he could tell whether a herd was accompanied by bulls as they were apt to take a parallel course slightly to the right or left of the main spoor which they crossed periodically so as to travel along the other flank. Each herd was attended by relatively few bulls which were of moderate size - presumably these younger animals had driven out the older males; ten of such outcast bulls, very old and cunning, teamed up to form a herd of their own. This herd never left the forest and even when moving through the densest parts proceeded with such care that they made surprisingly little noise; Hoey, observing that the snapping of a single twig in the forest was sufficient to alert immediately an elephant, expressed the view that the animal's hearing is more acute than when in the open – the reason being that he had known a bull standing in a swamp ignore someone, splashing through water a yard in depth, quite close by.

One day when Hoey was following the spoor of a big bull, he noticed that the animal had suddenly left the track where it led through a gap between the forest edge and a large bush; pondering on the reason for this abrupt departure, Hoey found himself on the brink of a cleverly concealed game pit. Evidently it had been detected or suspected by the old elephant for, twenty yards beyond it, he rejoined the track. Further evidence of elephant intelligence was demonstrated when Hoey wounded a bull; the animal fell but quickly rose again and immediately it was “surrounded by about ten cows who proceeded to help it along. Hurrying it to the centre of the herd, they rendered such effective assistance that, though followed by Hoey for ten miles, the wounded animal eventually got away. The shoulder height of the bulls which Hoey had shot on the Uasin Gishu ranged from eleven feet two inches to eleven feet ten inches.

While it has long been known that elephants will assist a wounded member of the herd, remarked Knowles (1914:8:149), he had never known a buffalo to do so until January 1914 when he had come upon one hundred buffaloes near Masaka, Uganda. Two big bulls, following a short distance behind the main body of the herd, sighted Knowles and were trotting away when he fired, wounding the oldest severely. The two went off together, crossed a dry ravine and ascended the opposite hillside in full view for the grass was short; as they climbed the wounded animal went slower and slower until, head down, he halted altogether, being very stricken. Knowles then saw the other bull, a fine beast with unusually massive horns, use his head to push his wounded companion on; thus urged, the old bull continued up the slope until the second bull, seeing that Knowles was overtaking them, swung round and was shot. Had this animal wished, said Knowles, he could easily have escaped but in effect gave his life for the old bull.¹ (Or, one might suggest, in the interests of the herd from which they were instinctively trying to get away.)

Elephants are nothing like so abundant in East Africa today² as formerly and WHG Grant (1953:93:15) remarked that it was only after forty years in the country that he had the opportunity of seeing some wild ones at close quarters; this was at Kitumbene Mountain where water has been piped from a gorge on Olgedju Longishu, which is about forty miles from Longido Mountain, to the arid steppe. From the pipe, which ends on a ridge of open bush, gushes a constant stream of clear cold water for the benefit of the Masai and their stock and for 30 or 40 yards around the outlet the

¹ For an account of a bull buffalo using its horns to assist a wounded companion to its feet, see the Annual Report of the Uganda Game and Fisheries Department as cited in the editorial of Country Life, vol 115, no. 2982, p 664 of 11 March 1954.

² ie, in 1957.

Kenya Casebook

ground was plastered with elephant droppings, giving some indication of the numbers that visited the spot each night. On the occasion of the Grants' visit a full moon shed its glittering light from a clear sky. At 9.30 pm a rhinoceros arrived but it was sufficiently cautious to drink from one of the ponds below the camp; the ponds, a series of them, were fed by furrows conveying the water from the outlet pipe. At 11 pm a large herd of elephants, clearly silhouetted against the sky, approached the ponds but did not come very close and at 3 am the Grants were aroused by their boys, they sprung from their bed and hurried out in their pyjamas to find a score of elephants in a pond only ten feet behind their tent. Ignoring tents, cars, campfires and people, the great beasts squelched around and bathed in the muddy water; between the herd and the Grants there was only a light screen of thornbush. The wind was favourable but at thirty feet even an elephant could scarcely fail to notice so many strange objects and Grant attributed their fearlessness to an overriding thirst. The only elephant to cause any misgivings to the onlookers was a cow, accompanied by a very small calf that could not have been many days old, she spread her ears and advanced a few steps towards the watchers but, changing her mind, moved off with the rest of the herd.

Apparently the cattle-fouled ponds were used only for bathing by the elephants who, for drinking, preferred the clean water as it left the pipe or flowed in the nearby furrows; the herd congregated about the pipe, milling and pushing one another as each impatiently awaited its turn at the water. The moonlight gleamed on the great wet bodies and, through glasses, even their eyes were visible. The cow was seen to lead her calf up to a broken-tusked bull who, after feeling the calf with his trunk, lurched away. Shortly afterwards another bull came from down-wind of the camp and, despite a fire not far away, stood to drink at one of the furrows; unquestionably this animal was very thirsty for he must have seen and got wind of the watchers. Grant, after extinguishing the fire, crept to within nineteen yards (measured the following morning) of this bull. The water in this furrow being only a couple of inches in depth, the animal had some difficulty in filling his trunk but "having filled it, he lifted his head high, curled the trunk into his mouth and squirted the water in, then, with a still further lift of his head, he swallowed. Between each trunkful the elephant swung his head and forepart round to look at me" his ears widespread but without ever raising a foot, stated Grant. Eventually, having slaked his thirst, he moved silently away, passing between the cooking pots left outside the kitchen hut without breaking a thing, and so disappeared into the night.

In March 1909, when CM Dobbs (1918:12:269) was commissioner at Kisii, he went hunting one afternoon and shot a carefully selected bull elephant; the herd stampeded as the great beast fell but when Dobbs approached the corpse he was surprised to hear strange sounds emanating from the tangle of bush and tall elephant grass bent earthwards by the fall of the pachyderm. The noises sounded as if some imprisoned animal was endeavouring to break out from the rank growth; there was little time for speculation, however, for an exclamation from Dobbs' gunbearer apprised him of the approach of a single cow elephant that, separating from the retreating herd, was now racing up the hill straight towards them. Hastily the two men retreated to a clump of grass behind which they crouched while watching the advancing elephant who, on reaching the carcass of the dead bull, commenced tearing away at the grass and bush that had been bent over by the fall of the bull. In a matter of seconds a small elephant calf struggled free from the tangle, whereupon mother and offspring quietly trotted downhill in the direction taken by the retreating herd.

With some elephants the herd instinct is so well-developed that a mother may receive assistance from her associates as is revealed in accounts by two members of the Kenya Game Department. About September 1945, from a high vantage point, stated GC MacArthur (1945:83/84:162) a couple of Indians were watching a small herd of elephant cows and calves when one of the latter was suddenly attacked by two lions that emerged from a donga. The screams of the calf brought several

Kenya Casebook

cow elephants to its rescue whereupon the two lions departed precipitously, leaving two other lions still hiding in the donga. Within five miles of this spot, which was on the Athi near Kibwezi, some natives heard the shrill screaming and crashing about of elephants; the following morning the men ventured to investigate and came upon the mangled remains of a lion. Every bone in the big cat's body was crushed and broken, while the whole area round the carcase had been trampled flat by elephants. One afternoon in the Northern Mathews Range, George Adamson was following up three lions that had killed one of his pack donkeys and he came upon, in some fairly dense bush, the predators who bolted straight into the middle of a small herd of cow elephants accompanied by calves whereupon bedlam broke loose, the elephants screaming, then chasing the lions. The carnivores made good their escape leaving the elephants, still seeking them, milling around until they scented Adamson and charged him.

Chapter 4

OF ANTELOPES

Not only young elephants are subject to attack by lions for, when hungry enough, the big cats will take on as formidable an ungulate as a bull giraffe; in such a contest a kick from the giraffe, or a swinging blow from its massive horned head, has been known to break the carnivore's back or stove in his skull. Usually, however, by attacking in force, lions are victorious as in the encounter recorded by CW Woodhouse (1913:6:55). In October 1912 an adult male giraffe, lame and suffering from a skin disease akin to that seen in cattle which have recovered from coccidiosis, was killed by lions at Rombo Hill. Apparently the first lion has sprung onto the giraffe's withers from a high bank near the river where the carcass was found. Two parallel rips, extending from the hock to the fetlock, were presumably caused by the claws of a second lion as it clung to the giraffe's flank and scrabbled for a foothold. Judging by the bites and lacerations on neck, shoulders and limbs, a desperate struggle then took place; when the carcass was found there were three or four lions on it, all of whom may have been participants in the contest.

It is when drinking that game is most vulnerable to attack, observes AB Percival (1913:6:55:photo) who constructed a hide, twenty yards from a waterhole near the Lorian Swamp, from where he obtained a fine photograph of a reticulated giraffe (*Giraffa reticulata*) and noted how, though by no means the wariest of animals, their arrival was apparently awaited by various antelopes who remained a few hundred yards away and only moved down to drink when the giraffes were satisfied that it was safe to do so. On this occasion Percival found that the waterbuck (*Kobus ellipsiprymnus thikae*), among which he saw a white fawn, were the wariest of the game, repeatedly sounding an alarm. Twenty miles west of the Lorian, when hunting along the west bank of the Northern Guaso Nyrio, Lord Gifford obtained a pair of white waterbuck; the herd from which they were shot, according to Percival (1911:1:10), also held two white buck, two females and two calves and one of these calves, which seemed to have grey patches on its head and neck, was being suckled by a doe of ordinary hue.

The occurrence of white waterbuck in the Lorian Swamp region had also been noted by a returning traveller (1912:4:127) who had collected and preserved two of the half-dozen he had seen; in every instance the white animal was associating with normally coloured beasts but on this occasion there were never more than two white individuals in a herd. As the eyes of these white buck were normally pigmented, these animals were not true albinos such as occur sporadically among waterbuck throughout their range. In view of the fact that normally coloured animals predominate in every herd, Richard Lydekker (1911:3:74) wonders how the strain manages to persist unless there is a definite attraction between the white animals that results in their mating. Normally coloured waterbuck are greyish brown, somewhat lighter below but usually darker on the face and lower portions of the limbs; however, there is considerable variation and a very pale form of the animal, from north of the Lorian Swamp along the Shebeli River in Somaliland, has been named *Kobus allipsiprymnus pallidus* by Matschie. Standing about four feet at the shoulder, the hornless does of these cross-haired, sturdily built antelopes, remind me of nothing so much as a shaggy pony or

small horse; though usually found within a few miles of water, the species is not so restricted in habitat as its name might suggest.

Strikingly different is the habitat and appearance of that handsome tragelaph, the eastern bongo (*Boocercus euryceros isaaci*), the flanks of which display about a dozen vertical stripes on its predominantly ruddy skin; its general appearance is further embellished by a variable amount of black markings on the head, neck, limbs and underparts. The slightly spiral, lyre-shaped horns resemble those of its much smaller relative, the bushbuck. Owing to their custom of keeping to bamboo thickets, dense forest or sedge swamps, bongo are rarely seen except by those who go in search of them; one of these was CJP Ionides who, when hunting the bongo for the Coryndon Museum, told (1946:87/88:138) of his observations of their relatively little known ways. Ionides noted that in the Mau Forest the pale stripes on a bongo's flanks definitely rendered the animal conspicuous, while in bamboo thickets the stripes were seen before the outlines of the antelope became clear and during heavy rain the bongo remained within the shelter of the denser forest instead of following their nightly practice of moving into the more open bamboo to feed. Their favourite food consisted of young bamboo shoots but they also ate the leaves of bushes and, at times, used their horns to break branches from trees in order to obtain the tender leaves; they visited salt licks with relative regularity. Each herd of bongo was composed of several females and their young in addition to the bull, usually a young animal, who at times would wonder off on his own and occasionally join up with an older bull; such older bulls never seemed to accompany the herd though usually keeping in its vicinity. While all bongo have acute hearing and appear to be very much on the alert, solitary bulls were even more wary and were extremely difficult to approach; in attempting this the Lumbwa and Dorobo, guides displayed great caution, but when following a wounded bull they invariably held their spears at the ready and warned Ionides to expect a charge.

Early one Sunday morning, wrote CM Dobbs (1913:6:60), his Nandi interpreter who lived in Kericho township, was aroused by cries of "nyama" (meat). Unfastening the front door of his hut the man stepped outside and was confronted by a fully grown bongo; hurriedly turning back to get his sword, the Nandi emerged and, according to his account, smote the bongo across the horns as the animal butted him. The second time that the antelope tried to butt the Nandi stabbed it in the neck with his sword whereupon the poor beast fell down and was promptly speared by the crowd of natives who had gathered round. Meat being their only objective, says Dobbs, it "can easily be imagined" what the remains looked like when seen by him; the ends of both horns were missing but these had been broken off in some previous encounter, the head had been hacked off in a most unprofessional manner and the hoofs and tail similarly removed. Nevertheless, Dobbs obtained a good photograph of the hide and skull. The local people declared that they had never seen an antelope of this kind before and seemingly had no name for it; strangely enough the bongo had apparently come from the general direction of the Reserve where, except for a small remnants along the streams there is little or no dense forest.

A better photograph of an immature bongo doe in the flesh accompanies a note contributed by HJ Twigg (1913:7:81) who had shot the animal near Escarpment at an altitude of 9,000 feet; in order to obtain the photograph it had been necessary to spend ninety minutes in the arduous task of chopping and clearing away the dense bamboo and bush.

While there is nothing unusual in man's meat-eating propensities, it came as a surprise to Merrell Dalton (1953:94:73) to find an antelope exhibiting carnivorous tendencies; he recorded that a young

female duiker¹ owned by Mr Taberer, Warden of the Amboseli National Reserve, selected scraps of raw liver from the dog's plate and ate them with evident relish; this animal regularly appeared at breakfast time to solicit scraps of bread but evinced no interest in toast, biscuits, fruit or vegetables. She spent the rest of the day foraging around the Lodge among the weeds, leaves and grass under the fever trees. Dalton wondered if this seeming perversion had been observed by other naturalists and his enquiry brought corroboration from Lt Col HF Stoneham (1955:22:205) who recalled that scraps of meat were relished by a tame duiker belonging to one of the officers at General Smuts' Headquarters in 1916.² Furthermore, when out shooting in Kenya, Stoneham had also seen a duiker stalking a bevy of guinea-fowl but the birds were too wary and the antelope failed in its attempt to secure one.³ Stoneham had so often been told by Africans of various tribes that duiker will pounce on, and eat, fowls, that he urged them to prove it. Finally some did so, summoning him to observe a duiker stealthily stalking a flock of feeding birds; tensely the watchers waited until the antelope considered itself near enough to make a final rush; as the duiker seized its prey, Stoneham shot the animal dead with the fowl, scarcely hurt, still in its mouth. This incident served to corroborate a story told him thirty years ago⁴ by the then Roman Catholic Bishop of Uganda whose fowls had been disappearing; one night the Bishop parked his car facing the fowl-run and waited. When a commotion broke out among the birds he switched on the head lights and they revealed a duiker as the predatory cause of his losses.

In a much earlier number of the Journal (1911:3:71) MP Seth-Smith comments on Harvey's duiker (*Cephalophus h. harveyi*) named after Sir Robert Harvey who obtained the first specimen on Mount Kilimanjaro.⁵ This stocky little forest-duiker, though a rich chestnut-red, is rarely seen on account of its largely nocturnal habits and wariness, despite its being relatively common in the forests around Nairobi where its presence is betrayed by a habit of depositing its droppings on one or other of the regular runways which it seems to use. Seth-Smith discovered that almost the only way to get a glimpse of this elusive little buck was to take up a position commanding a view of the spot where two of these duiker tracks met whereupon he arranged for several Natives to walk quietly through the forest so as to converge on the place. This plan proved successful, whereas, before, evening after evening he had visited forest glades without result. He noted that the horns of an adult male duiker are 3.5 inches in length, thick at the base and roughly annulate whereas those of the female are relatively large-based and sharply pointed but rarely exceed 1.5 inches. Seth-Smith went on to say that as an amateur he had failed to observe any difference between the "specimens of *C. harveyi* and *C. isaaci*" that he had seen at Tring and in the South Kensington Natural History Museum. At this juncture the Editor came to the rescue with a note saying, "The simplest distinction between Harvey's and Isaac's duiker is the difference in colour of the head tuft; in Isaac's duiker the hair of the forehead is mixed rufous and black with the surmounting tuft tending to chestnut whereas in Harvey's duiker the forehead is black and there is no chestnut in the head tuft".

¹ No species was mentioned but presumably this was one of the races of the common duiker (*Sylvicapra grimmia*) of whose craving for blood, or rather the salt that it contains, I have written elsewhere.

² General Jan Christiaan Smuts and his troops conquered German East Africa in 1916 and Arthur Loveridge, who was then serving with the East Africa Rifles, served as despatch rider for Gen, Smuts for a time. (Editor's note)

³ I have discussed the reason for the behaviour elsewhere (Forest Safari, 1956, pages 38 – 39, Lutterworth Press) when telling of a duiker's attempt to seize a dove within a few yards of myself and of another duiker landing in the middle of a covey of guinea-fowl. Both incidents occurred in Karamoja, Uganda, late in 1933.

⁴ That is, in 1927. (Editor's note)

⁵ Other alleged races occur in Somaliland, Eldama Ravine, Mount Elgon and the Belgian Congo.

This is confusion worse confounded! To begin with there is no such animal as “*C. isaaci*” which is obviously a lapsus on the part of Seth-Smith for *Cephalopus ignifer* which was described by Oldfield Thomas on the basis of four duiker skins collected by FW Isaac after whom the eastern bongo was named. Then the Editor appears to have reversed the distinguishing characters given by Thomas¹ who went so far as to say that there was no chestnut coronal tuft in the type of *ignifer*; at any rate Miss St Leger², the last reviser of the group, differentiates these clearly related races as follows:

- *Ignifer*: crest chestnut, coat shorter and harsher, skull moderately long (about 180mm)
- *Harveyi*: crest chestnut normally intermixed with black, coat longer and softer, skull short (about 170mm) and broad.

Recalling something of the thrill experienced when first I saw a Harvey's duiker in the Usambara Mountains, I can well imagine how CJP Ionides must have felt when success finally crowned his efforts to obtain, for the Coryndon Museum, so rare and elusive a creature as the eastern representative of the yellow-backed duiker (*Cephalopus silvicultor*). Apart from the streak of yellow hairs that starts at a point between the shoulders and broadens to the rump, Ionides (1946:87/88:92) described the general colour of this heavily-built little buck as being blackish brown with a tuft of long reddish hair between the small straight horns, the eyes being dark brown and there being some whitish colouring on the underside of the relatively large head which merges so imperceptibly into the thickset neck. The low carriage of the head, combined with the creature's stocky build, gives to this duiker a distinctly porcine appearance. The yellow-backed duiker is largely nocturnal or crepuscular, feeding at night or in the early morning on leaves and fallen berries; shortly after sunrise it seeks its form in a dense patch of thick bush or beneath an almost fallen tree trunk in the forest. If disturbed, this wary little buck moves off cautiously in skulking fashion or, when necessity demands, in a series of bounds; never pausing to look back it covers a considerable distance before again venturing to halt and then only in thick cover of which there is such abundance in the Mau Forest.

Visiting likely spots in the Mau Forest in early morning or late evening proved useless, Ionides found, partly because of the impossibility of moving silently through the bamboo forest and partly on account of the scarcity of these duikers. On two occasions Ionides attempted to organise a drive by utilising the services of the native bearers but lack of intelligent cooperation on the part of these men, combined with the difficulties inherent in executing synchronised movements through fairly dense forest towards the single gun, led to the abandonment of this method. However, eventually, on the twentieth day the hunt was successfully concluded by quietly stalking suitable cover upwind and then arranging for a semicircle of selected men to advance slowly downwind towards the form. Later an immature duiker was also obtained for, at least in some instances, the young are fully weaned by February.

A vivid day-to-day account of this month-long expedition into the Mau Forest is given (1946:87:88-91) by PRO Bally, botanist of the Coryndon Museum. When the party left Molo on 9 January 1946, and headed southwest to Sitoton, the dust was so deep as to cause the car and truck to swerve and sway; additional evidence of the dryness of the season was furnished by an extensive grassfire

¹ *C. ignifer* Thomas, 1903, Proc. Zool. Soc. London, 1, page 226: type locally known Eldama (as Eldoma) Ravine, Kenya Colony.

² St Leger, 1936, Proc. Zool. Sc. London, pages 209 – 228, where she makes both *harveyi* and *ignifer* races of *C. weynsi* Thomas, described from Stanley Falls, Belgian Congo, a disposition which has not met with acceptance by GM Allen (1939), GH Swynnerton and RW Hayman (1951).

Kenya Casebook

that they passed at 8,000 feet. The following morning 35 bearers reached Sitoton and the foot safari got underway to Sigutioi where camp was made in a beautiful clearing of the tall, bamboo-fringed forest. Before the tents could be erected, however, the entire party was drenched by a downpour of rain; roaring fires, however, were soon going but it was necessary to stop the men from using bamboo as it exploded with a noise so like rifle shots that it was thought that game for many miles around would be scared away. Three days after setting off the party camped beside a little stream at Bondui but, once again, before the walkers were settled in lightning and thunder-claps heralded the arrival of a storm; for a whole week rain in the afternoon became a routine ration. The final destination, Endabarra, was reached on 13 January when the tents were pitched in a small clearing of the mixed forest in which bamboo, macaranga and podocarpus predominated.

From tree to tree flitted a group of white-headed wood-hoopoes (*Phoeniculus bollei jacksoni*) as, seeking insects, they systematically probed the bark with their slender, slightly curved bills the red colour of which matched that of their feet. Except for the black belly, the body plumage was an iridescent bluish green, while the wings and elongated tail were a steely blue. Later Bally discovered that a pair of these beautiful birds were nesting in the podocarpus directly over his tent. At this altitude – 7,300 feet – though not freezing, the nights were extremely cold, making three blankets necessary in addition to the sleeping bag. Lying awake one heard the weird noises made by tree-hyrax as they called to one another, less frequently the raucous quacking cry of a galago or the staccato bark of a startled bushbuck. Apart from an occasional leopard one might have supposed that there would be few creatures to bother a bushbuck so far up; however, one day Bally encountered 24 wild dogs (*Lycaon pictus lupines*) in a grass-grown clearing of the forest near Sitoton. At that time, alone and unarmed, Bally was en route to his earlier campsite at Sigutioi where he hoped to procure certain forms of plant life that he had not come across at Endabarra where the possibilities were becoming exhausted after his having gathered 224 specimens. The wild dogs were magnificent specimens with bushy white tails and thick pelts, much more handsome than the mangy creatures one meets on the plains. Curious as usual, some of them rose on their hind legs in order to get a better view of Bally over the high grass. They allowed Bally to come within twenty yards of them; uncomfortably close, he thought, as he brandished the bamboo stick he was carrying whereupon they bounded away but frequently stopped for another look and to express their feelings by short barks. Bally wondered if they were responsible for the remains of a waterbuck that he had passed earlier in the day and was thankful to reach Endabarra after an absence of ten hours during which time he had walked almost thirty miles.¹

On 8 February the expedition packed up and everyone returned to Sitoton where Bally had left his car beside a forestry hut with instructions to the local forestry guard to keep an eye on it but, unfortunately, on attempting to start the engine Bally discovered that, during the month that it had been laid up, someone had turned on the switches for the lights and windscreen wiper and left them on. He imagined some mischievous children had enjoyed a gala time playing with them for no amount of cranking or pushing would persuade the engine to start; to get going they had to await the arrival of the hired truck which had returned to Nairobi after depositing them in the wilderness.

¹ In recounting, in 1957, this account of Bally's safari, Arthur Loveridge was clearly nostalgic for his own numerous safaris undertaken in East Africa in the 1920s, 1930s and 1940s. (Editor's note)

Chapter 5

OF SERVALS, AARDVARKS, WARTHOGS AND GIANT PIGS

Successful though Ionides had been in securing two yellow-backed duiker, no trace was seen of the West African golden cat (*Felis aurata*) of which a form had recently been taken in Kenya; to secure one had been the secondary objective of his expedition to the Mau Forest. All they got was a so-called "genet cat", one of the viverrids and not a true cat at all, though, like the felines, much subject to melanism. Blayney Percival, having told CW Hobley that black genets were present in Limuru District, Hobley goes on to say (1911:1:102) that scarcely a farmhouse in that district did not have some black serval of which he saw upwards of twenty skins during a single tour. They exhibited some variation in the degree of melanism, ranging from jet black to a rich dark brown. In these lighter skins a trace of the normal spotting might be distinguished. Remaking on the presence of black servals on both the Mau and Mount Kilimanjaro, Hobley speculated as to whether there is some connection between melanism and altitude.

Years later M.A.B. (1943:16:224) commented on the abundance of black leopards in Ethiopia, from which country considerable numbers of skins were finding a ready market in Kenya; the majority of these skins are a deep sooty brown with slightly darker spots and rosettes distinguishable in shadowy form. One such pelt had white hind feet, the white hairs of the soles extending up between the pads so as to surround the claws; unfortunately the front feet were missing from the skin. Other skins displayed a broad band of dense, glossy, jet-black fur down the centre of the back from head to, and including, tail and on flanks and legs the jet-black spots were so close together that the basic colour, a medium neutral grey, showed between only a very delicate tracery. Much variation occurs, however, and caudal rings, while shadowy in some, are clearly defined in others. These leopards are presumably referable to *Felis* (*Panthera*) *pardus adusta*.

For those unfamiliar with taxonomic procedure it might be added that the first of the four names represents the genus, the second the subgenus (which some mammalogists would elevate to generic rank), the third is the species and the fourth the geographical or racial name that Pocock assigned to the form inhabiting the Highlands of Ethiopia (as Abyssinia). To assign the correct name to "a serval" is even more difficult. Professor A Toschi (1946:87/88:133) has made some suggestions as to the classification of the large spotted servals of Kenya; he thinks that *Felis* (*Leptailurus*) *serval hindei* of Machakos inhabits the eastern portion of the colony, *F. (L.) s. kempi* of Kirui's, Mount Elgon, the west. But who will shoulder the task of defining their precise ranges and the region where they meet and mingle?

EW Harper (1914:8:154) wrote that ever since their kittenhood he had kept, in an eight feet long cage, two adult servals who had always been on friendly terms except at feeding time which was at about 8 pm each day. At such times the male was apt to be aggressive and, on one occasion, in order that a visitor might see them eat, their meal time was advanced by several hours. Until then the female had been perfectly healthy but the next day she was found dead with part of her neck and shoulder eaten; for the purpose of observation the corpse was allowed to remain in the cage

Kenya Casebook

during the day when the male was seen to eat more of it. It is fair to assume that she had been killed by the male and that the alteration in the feeding routine was responsible for this cannibalism.

Between Muhoroni and Kibigori stations on the Kenya Railway are numerous small gullies that in earlier days were simply bridged by rails attached to sleepers that rested on girders; the sleepers were spaced about eighteen inches apart without any flooring between them and at mile 551 the bridge was not very high but between ninety and one hundred feet in length. As the 4.35 pm passenger train out of Muhoroni approached this bridge on 19 June 1919 the locomotive driver (E Holloway:1921:16:58) was hailed by his African fireman exclaiming, "Simba, Bwana." Leaning out of the cab Holloway saw no lion but three cheetahs (*Acinonyx jubatus raineyi*) on the bridge ahead of the engine; one sprang to the ground and bounded away but the remaining two, continuing to pick their way from sleeper to sleeper, were struck by the cow-catcher – of these one was knocked off the bridge and killed and the other, minus its head, dropped between the sleepers. The train was halted and the unfortunate animals removed for skinning. In one respect the non-retractile claws of the leopard-like cheetahs help to bridge the gap between the true cats and members of the dog family such as jackals.

Africans frequently complained to CM Dobbs (1912:5:62) when he was in charge of Kisii District that their maize crops were being raided by an animal that barked like a dog. Later, when stationed in Kericho District, he observed whole shambas that had been devastated; consequently he was surprised to learn that this predilection for maize by jackals was apparently a local development peculiar to Nyanza Province. Even the stout thornbush fence surrounding the prison maize shamba failed to prevent considerable damage; in some places the jackals had forced their way through the fence but where it was lowest they sprang over it. After breaking down a stem so as to bring down the cobs to the ground, the raiders proceeded to gorge in comfort; seemingly they liked the corn while still soft as they displayed a preference for unripened cobs. However, among the maize Dobbs scattered small scraps of strychnine-impregnated meat and in the prison shamba alone ten jackals succumbed to the poison. The stomach of one held partially digested maize; such corroboration was scarcely necessary in view of the fact that maize was so often present in jackal excrement found upon the paths in the vicinity. In Kericho District 1912 appeared to have been the first year in which jackals made serious inroads in to the maize crops; whether this was due to their having just discovered its edibility or owing to some shortage of their accustomed food is hard to say. Should their raids on shambas continue, Dobbs feared that they would constitute a serious menace to the food supply but, with an acumen unusual for those days, he counselled caution in launching an extermination campaign lest some other vermin on which jackals prey become an even worse menace. AB Percival (1914:8:150) recalls being shown some apples that had been partially eaten by jackals.

Dobbs was uncertain as to the species of jackal involved, so described one briefly; the ears were dark brown behind, the nape was grey, the back dark brown, the limbs were fawn and there were some white hairs at the end of the black-tipped tail. The tail comprised 15 inches of the total length of the skin which was 35 inches overall; he estimated the height of the animal as about 16 inches. Dobbs' careful description leaves little doubt that he was dealing with the race of side-striped jackal that was described from Kisumu two years later as *Thos adustus bweha*; the subspecific *bweha* is founded on the onomatopoeic name applied by many East African tribes to whichever of the three species of jackal occurring in their region. The sharp barking cry of these scavengers is familiar to most campers on the plains of East Africa.

Animals frequently display a greater degree of adaptability than we are willing to concede, despite

the evidence of their survival through countless centuries; similarly the widespread dispersal of many species suggests that for one reason or another individuals must often have wandered far afield, invading – temporarily at least – uncongenial habitats. Surprisingly, enough of these very few instances have been recorded in the pages of the Journal. Indeed, with the exception of those of the bongo and elephant already mentioned, the only one that occurs to me is of an otter mentioned by Major JH Kingdon (1946:85/86:67) of Thego Ford, near Nyeri.

It may be assumed that Major Kingdon is sufficiently familiar with otters, having already seen four of them during 1945; the fifth was observed at 5.15 pm on the hot afternoon of 10 October as Kingdon's car was approaching a bridge spanning a dry gulley. Emerging from the long grass fringing the road, the otter was about to cross it when it caught sight of the car, only thirty feet away, and turned back; its tracks were plainly visible in the soft dust and Major Kingdon got out of the car to examine them. It seemed strange that the animal should not have waited until night-time to travel; at that point it was fully two miles from Nairobi River and a mile from the Thego. If migrating from one river to the other, the otter was following the course of the gulley which afforded it some cover and occasional rain-filled pools or a permanent spring; the only alternative assumption was that the animal had left Thego Ford and embarked on a foraging expedition.

The page of the Journal that carried the note on the diurnal wanderings of an otter also bore a most painstaking analysis of the diet of an even more strictly nocturnal mammal – the aardvark (*Orycteropus afer aethiopicus*); the appropriateness of this Boer name, which means earth-pig, though technically as erroneous as its British counterpart of antbear, can be seen from the photograph by Captain RO Crewe-Read facing page 421 (1919:14). The subject of this snap was dug from its burrow near Naivasha Railway Station by some Africans who carried it in a bath tub to the District Office or boma. This was quite a feat for it took four men to lift the stocky beast which, though the note says "must have weighed at least 120 pounds", appears from the photograph to be nearer twice that weight. From the end of its elongate and pig-like snout to the tip of the tremendously thick tail, this aardvark measured five feet two inches while its height at the shoulder was about two feet. During the six months preceding its capture, remarks VGL van Someren (1919:14:421), an unusually large number of aardvarks had been seen in broad daylight and in the Uasin Gishu district alone about a score had been shot. The resident Boers of that region averred that it is only during prolonged droughts that aardvarks move about during daylight and this same view, continued van Someren, is held by Africans in Elgeyu District; this would seem to be corroborated by the then current dry spell which was creating famine conditions.

Though no teeth are present in the front of the mouth, on either side there are five maxillary and five mandibular teeth – twenty altogether; a cross-section through one of these teeth reveals their peculiar structure which consists of numerous polygonal-shaped tubules. I might add that it is this unique formation which resulted in the aardvarks, a purely African animal, being assigned to the mammalian order tubulidentata; formerly, together with the toothless and scaly pangolins of the order pholidota, they were referred to as edentate (ie, toothless). This unfortunate arrangement was doubtless responsible for Captain Crewe-Read's misstatement (1919:14:422) that his captive antbear was toothless; on the contrary an aardvark's grinding teeth are used to good purpose as crushers for the vast quantities of ants necessary to nourish an animal the size of a sow. Some idea of the numbers of insects involved can be gained by Patrizi's note (1946:85/86:67) on the stomach contents of a freshly killed aardvark received at the Coryndon Museum. Of the total volume, 1045 cc, of the stomach, 211.2 cc consisted of grit and the chitinous fragments of insects; the remaining 834 cc was comprised of entire, or partly digested, ants and termites. By identifying and counting the recognisable individuals contained in 9 cc, Patrizi was able to form a rough

Kenya Casebook

estimate of the composition of the aardvark's last meal; it was:

Microtermes (?) and termes (two species of termites, the so-called "white ants" normally found occupying the same nest):	7,042
Dorylus helvolus (one of the soldier ants or siafu):	118,891
Pheidole crassinoda (a species of seed-storing ant):	4,356
Camponotus rufoglaucus (one of the carpenter ants):	a few
Megaponera foetens (common, large, black stink ants):	a few

If one takes into account the quantity of semi-digested insects, as evidenced by their chitinous remains, Pareizi felt that the foregoing figures might fairly be increased by a third; also present in the stomach were a few adventitious seeds of a curcubitaceous plant together with some leaflets of albizzia but not a trace of termite fungus, commonly called "ant bread". As Megaponera prey largely on termites, the few individuals ingested by the aardvark might well have been picked up by its sticky tongue accidentally either in, or close to, a termitarium.

That termites formed so small a proportion of the total catch seemed strange in view of the vast numbers available to an aardvark once it had broken into a nest and that this animal in question had attacked nests was clear, for all stages of development were represented by the Termes, Dorvlus and Pheidole found in its stomach. On the other hand, though aardvarks or their burrows were much in evidence in the Eldoret District, neither Patrizi nor his companion came upon a termitarium or anthill that had been raided by Orycteropus. This despite the presence of innumerable grass-covered mounds of Cubitermes on the veld around Eldoret. Patrizi points out that his findings conflict with those of Herbert Lang¹ based on thirteen aardvarks of a different race (*O. a. faradjus*) taken in the Haut Uele of the Belgian Congo; of his aardvarks Lang wrote, "their food consists of white ants (termites) and true ants are only incidentally taken as they often inhabit termitaria". Lang continued, "The absence of stone and grit indicates that the gastric juices play the most important role in the disintegration and digestion of food and are sufficient to assimilate the soft-bodied termites but not the well-chitinised ants. Numerous parasitic worms are thus enabled to live in the stomach". Patrizi remarked that not a single parasite was found in the stomach of the Nairobi specimen and expressed doubt as to whether the presence of grit had anything to do with it; he concluded by advising caution when generalising about the habits and economy of animals.

Whether termites or safari ants form the major food of an aardvark is of minor consequence compared with the importance of assuring that the services of an animal, so valuable from the human viewpoint, should be retained. Fortunately this has been settled by international agreement but it rests with those who live in Africa to make the fact known and see that the legal provisions are enforced. Captain Crewe-Read, after photographing his captive aardvark, turned it loose and, promptly, the animal attempted to burrow through the loose-built wall surrounding the boma, ejecting large stones with astonishing ease. The creature had almost disappeared when an African laid restraining hands upon its massive tail; at that the aardvark turned its powerful claws – presumably developed for tearing open cement-like termitaria – upon its captor, much to the detriment of the man. Again released, it trotted down the road completely ignoring some pestiferous dogs that wished to molest it. Arriving at the Rift Valley Hotel it attempted to enter the bar but we may, perhaps, attribute this misguided action to the fact that the aardvark appeared to be blinded by the sunlight and blundered into anything in its path. However that may be, it was gently but firmly prevented from entering the hotel whereupon it went to earth in an old aardvark burrow just across the way.

¹ Bull. American Museum of Natural History, 45, page 327

The superficial resemblance of an aardvark to a domestic pig certainly excludes the tail, also the powerful claws with which the ant-eater digs its burrows. With the various wild pigs of East Africa it has even less in common but Woodhouse (1911:3:40) told us that aardvarks' excavations are frequently taken over by warthogs (*Phacochoerus aethiopicus aeliani*); if surprised in the open, and hotly pursued, a warthog will make for any suitably large earth and, suddenly slewing around, enter backwards with its business end ready for rearguard action. Should a warthog decide to permanently appropriate an aardvark burrow the new tenant will enlarge it by rapid movements of its forefeet which throw back the earth; as the distance from the entrance increases, however, the warthog turns around and employs its grotesque head and curling tusks to push the soil out.

The enormous development of the upward-curving canines and the prominent facial knobs immediately distinguish the plains- or savannah-loving warthog from its porcine relatives of bush and forest. The huge wart-like protuberances, of which there are six, probably serve to protect their owner from the tusks of his rivals, for they are better developed in the boar than in the sow; the base of each, supported by a bony projection, of the most prominently conical pair, is situated on the cheek immediately below the eye that it seems designed to shield. Of the somewhat smaller conical pair, one occurs on either side between the orbit and base of the tusk, though nearer the latter; the third pair are greatly elongated and extend horizontally along either side of the lower jaw. It is the tusks of the lower jaw which are brought into play to deliver the characteristic right and left slash when a warthog is on the defensive; the strokes are achieved by swinging the gaping lower jaw well to one side and then to the other. Normally the enamel-cased lower canines rest against the upper, serving as hones to keep them sharp, for the curling tushes are of softer texture and are chiefly employed as aids to digging.

The rooting of a warthog in search of food appears to be directed chiefly towards bulbs of the lily and gludrol; however, at times, wrote Woodhouse, the bare ground about the nests of harvester ants seems to attract the attention of warthogs, for after rain their slots can be seen about such excavations though the latter are more often the work of aardvarks. Buteita is the Dorobo name for the warthog, said Woodhouse, but since he wrote of its distribution much has been learned. All warthogs are now assigned to a single wide-ranging species with ten allegedly recognisable races; exclusive of forest areas, the range of the species today¹ extends from Senegal to Eritrea, south of the Orange River – even beyond in the southeast, a century or more ago.

Native rumours regarding the presence of a huge pig-like mammal in the eastern Congo, having reached Sir Harry Johnston, he suggested² that the basis of such reports might be a pigmy hippopotamus such as was known from Liberia; this was only seven years before Woodhouse had discovered the giant forest pig (*Hylochoerus m. meinertzhageni*). The description was based on a specimen killed by Natives at the Friends Africa Mission at Kaimosi, near the Kakamega Forest of Western Kenya Colony and subsequently a doubtfully distinct race was described from Northwest Tanganyika Territory; others from French Cameroons and as far west as Liberia. Woodhouse apparently writes from experience of the giant pig in the Mau Forest where it favours the denser bamboo thickets through the undergrowth of which it makes runways. At times a boar may be observed crossing from one patch of forest to another; old boars, and sows accompanied by young, are apt to separate from the sounders which are frequently quite large as the giant pig is a gregarious animal.

It is a thickset beastly, long in the body and short in the legs; whilst lacking the high conical tubercles

¹ That is, in 1957. (Editor's note)

² HH Johnson, The Uganda Protectorate, London, 1902, page 206.

of the warthog, it has, on either side of the face below the orbit, a massive wart that more or less merges with a second one which extends from just below the ear forwards along the lower jaw. In the sow and young this horizontal tubercle carries a tuft of white hair, represented in the boar by a few scattered white hairs; otherwise the general colouring is black, the entire body and limb being covered by lank black hair, longest and most abundant on the back of the young. In old beasts it is worn or lacking, doubtless lost by the animals forcing their way through undergrowth. So thick and tough is the hide that the Dorobo and Kakamega peoples prefer it to any other, even that of the buffalo, for making their shields.

Woodhouse describes the massive skull, with its great lateral developments, bony bosses and dentition in considerable detail; he observes that the tusks, though huge, and normally curving back to a point in sows, are apt to be broken and worn in old boars and fall short of the dimensions which they attain in a warthog. Nor does the giant pig go rooting like the warthog for no sign of such behaviour will be seen even though one may follow the spoor of a giant pig for miles. Such turned-up areas as one encounters in forest clearings appear to be the work of bush pigs. The favourite food of the giant pig, allegedly shared with the bongo, seems to be the succulent tops of a thin-stemmed plant that attains a height of about three feet; this plant, which occurs in great profusion throughout the forest, has glabrous green leaves and white flowers. The characteristic droppings of a giant pig resemble those of a hippopotamus though naturally smaller. The spoor, too, is distinctive, its outside edges being rounded while the toes fail to meet and are somewhat splayed; in soft soil the rear trotters make quite a deep impression.

After wallowing, a giant pig resorts to some favourite tree around which it rubs itself in an effort to remove superfluous mud; such trees, marked or worn to a height of 3½ feet, are much in evidence in forests that are frequented by giant pigs. If disturbed, the alarmed pig will trot away with its tail raised vertically but the tip dropping over the back in similar fashion to the way that a warthog's tail is carried in retreat. Litters consist of from two to six piglets, the larger number being produced by old sows; young animals may be encountered at all seasons, say the Dorobo. Tiny piglets are clothed in soft brown hair but black hair soon appears among the brown and the latter are gradually shed, so by the time that a young giant pig has attained a length of two feet six inches it presents an almost entirely black appearance. As they grow long, both brown and black hairs become so stout and strong that they are practically bristles and in young animals the white hair on the cheek tubercles is very noticeable and the front is whitish.¹

The Kenya white-faced bush-pig (*Potamochoerus porcus keniae*)², frequently regarded as but an eastern race of the handsome red river-hog (*P. p. porcus*) of West Africa, is described by Woodhouse as having on its occiput, withers and back, a white crest the long hairs of which extend down the back in old animals. The flanks are more or less reddish, for there is considerable variation – both individual and due to age – so that the general appearance may be blackish. Owing to their nocturnal habits bush-pigs are rarely encountered but when seen are generally in pairs or small family parties. Due to the dense nature of the scrub that they frequent such animals are difficult to shoot; marshy clearings in the savannah are favourite feeding grounds and in such spots bush-pigs carry out extensive rooting operations. The tushes are relatively small, the upper being horizontal with a broad surface for the lower tusk, and the flat grinding surfaces of the other teeth are not dissimilar to those of the domestic pig.

¹ For a more recent account, accompanied by six photographs from life, see CH Stockley, in *Country Life*, for 1.viii, pages 341 – 342.

² Referred to by Woodhouse as the white-striped bush-pig (*P. choeopotamus*).

Chapter 6

THE DIVERSE DIETS OF SOME BIRDS OF PREY

As might be expected, more pages of the Journal are devoted to observations of birds than to any other class of vertebrate or invertebrate and this is not surprising for, quite apart from the interest that birds arouse in mankind generally, the dullest arrival in East Africa cannot but be impressed by their numbers and variety. The frequency with which birds of prey or carrion may be seen soaring in African skies is likely to surprise a newcomer from the more densely populous countries of Europe where, for centuries, poultry protectors or gamebird guardians have turned suspicious guns on anything resembling a hawk. The least hawk- or vulture-like of these groups is the stilt-legged secretary bird (*Sagittarius serpentarius*), so named from the fancied resemblance inspired by its crest feathers to an old-time clerk carrying a quill pen inserted over his ear. Though the huge nest of this stork-like bird is apt to escape notice, accounts of two are to be found in the Journal.

The first is by a schoolboy named Henley who, in April 1941, climbed to the nest of a secretary bird on the top of a fifteen feet high gambura tree at Molo. Lying in the centre of the nest, its neck and back torn open, was a yellowish mongoose, possibly killed while attempting to steal the solitary egg; beside the egg were three potatoes that showed signs of having been pecked and a fourth untouched – doubtless all came from Kikuyu cultivations about a mile away. Was the editor of the day indolent, or did he foresee a great future for the young contributor, as the note (1943:75/76:123) is merely signed “Henley, Prince of Wales School”, as if its author was already a bishop or peer who had no need of initials? Nevertheless, this April record, perhaps because it was too vague, appears to have escaped Praed and Grant¹ who gave “May and June, also October to December” as the nesting season of the secretary bird in Kenya.

The second and more detailed account is furnished by an ornithologist, J Blom-Bjorner (1945:83/84:158), who found a nest in Como Valley, Thika on 2nd May; on that day he was standing beneath an isolated, flat-topped thorn tree when a lizard buzzard (*Kaupifalco monogrammious*) flew past. As Blom-Bjorner fired at the buzzard a secretary bird took off from the tree above his head; there, quite invisible from below because it was placed in the centre of the crown at a height of fifteen feet from the ground, was an obviously new nest to which the owner returned fifteen minutes later. The nest was constructed of sticks blackened by grassfires, together with Sodom-apple stems and the lining consisted of tufts of grass torn up by the roots and a few green leaves. When found, the nest contained a single, somewhat glossy, white egg that was slightly pointed at one end. A re-examination of the nest on 5th May revealed that a second egg had been added; the pair resembled oversize turkey eggs for they measured 76 x 57 mm and 78 x 56 mm respectively.

On this occasion an observer, posted 100 yards away, noted that the cock bird, who was on the nest, did not stand up when an African tapped the trunk of the acacia with his hunting knife; instead it appeared to slide off the nest into flight in a single movement. Shortly afterwards the hen bird

¹ CW Mackworth-Praed and CHB Grant, 1952, *African Handbook of Birds* (1), 1, page 129.

Kenya Casebook

was seen approaching the tree with a beakful of lizards; Blom-Bjorner; who had procured a special permit to collect the bird for study purposes, shot her on the wing. An examination of her crop revealed five lizards in addition to the dismembered wings and breast of a young partridge of which the head and legs were in the stomach, together with two more lizards and many locusts. The ovaries, besides numerous small ovules, held two larger ones with diameters of $\frac{3}{4}$ inch and 1 inch respectively, suggesting that the secretary bird may lay twice per year – “probably April - May and October – November” in this part of East Africa.

In the past the true vultures, large and imposing though they appear in flight, received rather less attention from ornithologists than might be expected; perhaps the explanation may be found in the circumstances attending the skinning of such birds. Not only is the process a lengthy and tedious one during which the swarming lice transfer themselves from chill corpses to warm skinner, but the latter frequently requires determination and a strong stomach if he is not to be overcome by the nauseating stench. Their appearance in life is dealt with by MEW North in an article entitled “Field Guide to the Scavenging Birds of Kenya” (1942:71/72:61-68) and the accompanying photographs of the various species in flight clearly display their characteristic attitudes and distinctive markings. Commenting on the difficulties attending identification in the field because of the successive plumage changes from immature to adult, JG Williams (1954:95:78-79) pursued the subject in the first instalment of “Kenya Birds of Prey in Flight”; so as to emphasize the contrasting appearances of each species, his article is illustrated by diagrammatic drawings of soaring vultures as viewed from below.

One of the most readily recognisable, partly because it is not a true vulture, is the African lammergeyer or bearded vulture (*Gypaetus barbatus meridionalis*); this huge bird is characterised by its diamond-shaped tail, very long wings and, when adult, a white head whose red eye is enveloped in a black streak. An inhabitant of the more mountainous parts of Ethiopia and South Africa, one of the earliest records of its occurrence in Kenya appears to be that of 29 January 1914 when A Blayney Percival (1914:8:141), field glasses in hand, saw one sail overhead as he stood on Hospital Hill, Nairobi. Percival enthusiastically describes its flight as “quite the most beautiful” of any bird that he knew, adding that he had only once before seen a lammergeyer and that was in the vicinity of Lake Rudolf. As recently as March 1943 this rare species was unrepresented in the Coryndon Memorial Museum collection; this we learn from the List of Falconidae published by the Director, Dr LSB Leakey ¹ (1943:75/76:114).

Though not uncommon in some districts of Ethiopia, where it had been seen by Captain JRI Pollard (1944:81/82:94), thirty years, from Percival's sighting, elapsed before another was recorded from East Africa in the pages of the Journal; then, during October 1943, Pollard saw a pair at 14,000 feet in the Gorges Valley of Mount Kenya. Again in December, as his head appeared over the lip of a crater (the identity of which is purposefully not revealed) that he had climbed, Pollard experienced the thrill of seeing and photographing, at eye level and at a distance of 50 yards, a lammergeyer as it sailed and circled before alighting on a ledge where sat a second bird preening itself. A brief account of the appearance and habits of the lammergeyer, seemingly drawn from European and Asiatic sources, of this widely distributed species were furnished by Raymond Hook (1952:92:66). He told us that the long and specialised tongue is supposedly used to extract the brains from skulls and the marrow from bones; to reach the marrow, the bones are carried up to a height and dropped on rocks, hence the alternative name of ossifrage by which this bird was known to ancient peoples. Similar treatment is accorded to tortoises, one of which, allegedly falling on the head of Aeschylus,

¹ Dr Louis Seymour Bazett Leakey (1903 – 1972), anthropologist, of whom the mentor was Arthur Loveridge. See Leakey's Luck by Sonia Cole, 1975, Collins, pages 133 and 183. (Editor's note)

killed that Greek philosopher and poet!

Another group of predators, the harrier-eagles, prey on reptiles almost exclusively; in fact, relying on this, I have derived some slight kudos by challenging African skinners to guess at the stomach contents before they commence work. When they have suggested a bird or rodent I have countered this by prophesying a snake; nor has a harrier-eagle ever let me down for there were always at least a few scales to support my prophesy! Fortunately for my prestige I never shot a brown harrier-eagle (*Circaetus cinereus*) like the one seen by J Blom-Bjorner (1945:83/84:159) walking through a patch of swampy grassland in the Como Valley of Thika District; upon opening the crop of this almost uniformly dark brown bird it was found to contain a large toad¹ that had been swallowed whole. Blom-Bjorner points out that the late Sir Frederick Jackson had once recorded finding a large toad, not a frog, together with the fur of several rodents in a *cinereus* that he had shot at Jipi; appreciating the unusual nature of this diet, Blom-Bjorner concluded by saying that two other brown harrier-eagles that he had obtained at Thika held snakes, apparently cobras² but too decomposed for certain identification.

The same page of the journal carried some observations by Sidney Blom-Bjorner on another member of the genus – the banded harrier-eagle (*Circaetus cinerascens*); the generally dark brown or ashy grey upper plumage of this bird is relieved by the white of its dark-barred tail. On two separate occasions a male had been seen sitting in a large tree overhanging the Chania River at Thika and when shot, the first one was engaged in eating a snake that then fell into the river, however, scales and vertebrae of a second snake were present in the stomach. The crop of the second harrier-eagle held two green snakes.³ Another hawk with a specialised diet is Anderson's peon or bat-eating buzzard (*Machaerhamphus alcinus anderssoni*); in conformity with its unusual diet, this almost black predator has a wide gape, though its bill is short. At Burkau, Port Durnford, one swooped upon, and captured, a bat quite close to AB Percival (1914:8:151) who had observed it on three successive evenings; previously he had seen this rare bird at Takaungu, Mombasa, Taru waterholes and on the Zambesi.

Caution is advisable when predicting what a bird will, or will not, eat and, until I read Mr Sidney Blom-Bjorn's notes (1945:83/84:159) on a honey-buzzard (*Pernis a. apivorous*), I had always thought that this European migrant was exclusively insectivorous, feeding principally on bees and wasps or their grubs, varied only by other insects when its chosen prey was hard to find. On a July morning, related Blom-Bjorner, he was sitting on a veranda near the Indarugu River when a big bird, flying fast and hard, passed overhead; from below it looked very white, then the buzzard half-closed its wings and, descending at an angle of 45° with the speed of an arrow, settled on the summit of a tall eucalyptus at the edge of a plantation. As the tree was only about 250 yards away, Blom-Bjorn picked up his shotgun and set out along the upper edge of the plantation which sloped steeply downhill; at first there was no sign of the big hawk, then a clamour raised by small birds directed his attention to the nest of a Kenya green-pigeon (*Treron calva brevicara*). On it stood the honey-buzzard engaged in eating something which later proved to be a pigeon embryo, for that, together with fragments of eggshells and some ants, was all that that bird's crop held. The buzzard proved to be an adult female, her plumage worn and old except for three new secondaries in each wing and the two centre tail-feathers which were also new. For a migrant honey-buzzard to be dallying in Kenya so late – 2 July 1944 – was unusual, possibly the latest date on record, suggested Blom-

¹ Almost certainly the common square-marked toad (*Bufo r. regularis*).

² If correct, presumably the black-necked cobra (*Naja n. nigricollaris*).

³ Identified as *Chlorophis* which is now regarded as a subgenus of *Philophamnus*, in which case the snakes would probably be the common East African green snake (*P. irregularis battersbyi*).

Bjorner.

It is no uncommon sight to see soaring above the East African plains a pair of handsome augur buzzards (*Buteo rufofasciatus*), their white breasts shining in the sun and their rust-red tails fanning or folding in response to the need of the moment. Their nests too are frequently conspicuous, placed near the top of a tall, and often isolated, tree; in the Mau Forest WM Congreve (1913:3:46) found that the nests were usually built in one of the so-called cedars. Though readily seen, such nests are not so easily reached as cedar bark provides a poor grip for climbing irons and without irons the lower trunk is insurmountable, except perhaps for a dorobo or a monkey.

One buzzard's nest was near the crown of a decaying cedar, standing alone in the middle of a small glade; though this nest had long been known to Congreve, he had no means of knowing at what season it might contain eggs. However, on 20 August 1913, to his great joy, an augur buzzard flew from the nest in response to a tap of his foot on the trunk and the following day, with the aid of irons, Congreve attempted to climb the tree. It was about thirty feet up to the fork which held the nest which was obviously the accumulation of many years, for the basic pile of sticks and boughs was eighteen inches in depth and thirty inches in diameter. To manoeuvre his way past and above so bulky a structure was no easy undertaking but when, after considerable difficulty, Congreve at last managed it, he found that the nest was neatly lined with green leaves of the wild olive placed on leaf-bearing twigs of the same species of tree. Upon this greenery lay two dirty-white eggs, one almost devoid of markings, the other handsomely smudged and streaked with reddish brown, principally around the larger end, interspersed with scanty markings of a leaden-grey hue. One egg was on the point of hatching, being already cracked and both were in the final stages of incubation. When Congreve left, and before he was one hundred yards from the tree, one of the parents was back on the nest, though neither buzzard was apparent during his inspection of the nest.

There is always something of a thrill in finding eggs in a hawk's nest that has been reached after an arduous climb – how much more so when it involves an eagle that is distinctly rare in Kenya. Arthur Firmin (1944:81/82:95) relates how he and Group-Captain Douglas Hamilton were climbing a 300 feet cliff when they observed a Verreaux's eagle (*Aquila verreauxi*) that was building its nest about 100 feet from the summit; despite its great size the nest, which consisted of a vast agglomeration of sticks, was not very conspicuous, being situated on a ledge of rock from which jutted a small tree that afforded it some support. This was on 3 April 1944 at which time they ascertained that the nest contained no eggs. Returning on 14 May they approached the nest from above and, after roping-up, descended with difficulty and secured two photographs (cf. accompanying plates); one showed the bird on her nest and the other, two eggs in situ. This second picture could only be taken by making a detour involving some difficult climbing which enabled the photographer to land on the ledge. After further exposures were taken, the eggs were placed in a rucksack and carefully lowered down the rock-face; these eggs measured 80 x 59.5 mm and 75 x 59 mm respectively and were presented to the Coryndon Museum, to the collection of which they were a welcome addition added the curator LSB Leakey¹ (1944:81/82:95) who proceeded to describe them. The larger egg was almost white, faintly tinged with green and sparsely spotted with pale mauve and the smaller egg, though similar in ground colour, was boldly spotted, particularly around the larger pole, with two shades of reddish brown. The two eggs showed different degrees of incubation, that of the larger being assessed at 15% while the smaller was noticeable less – about 7% or 8%. Despite this relatively slight amount of incubation the hen bird sat very closely and, after leaving the nest, remained nearby, she and her mate circling around and watching the rifling of their nest without any

¹ See footnote to page 43. (Editor's note)

attempt at defending it. It was reassuring to know that the eagles soon set to work and constructed a new nest within a short distance of the old one. When visited by Firmin on 16 July the hen was already brooding a fresh clutch of eggs; these it was hoped to keep under observation with a view to determining the duration of incubation and the extent of time that the eaglets remain in the nest.

For persistent nest-robbing few can surpass the handsome harrier-hawk (*Polyboroides t. typus*) whose depredations made its alternative name of bare-faced hawk seem singularly apt but actually this designation was given to it on account of the naked yellow skin surrounding its eyes. The head has a somewhat vulture-like appearance though the adult plumage is predominantly grey, spotted or indefinitely barred with black, except for the long tail which is black with a conspicuous whitish crossbar; from end of tail to tip of beak this tall hawk is only slightly under two feet in length.

Hugh Copley (1945:83/84:161) tells us how he watched two of these birds flying down the Gura River as they assiduously sought the pendant nests of weaver birds; so systematically did they conduct the search, during the period Copley had them under observation, that he never saw them miss a nest. On finding one, the hawk, wings waving to and fro to maintain its position, clung its claws while it thrust its head inside the nest in search of eggs or fledglings. This observation interested me as on the rare occasions that I had seen a harrier-hawk rifling nests, it was their exceptionally long and, allegedly, double-jointed legs that they thrust into nests and, in one instance, the taloned claw withdrew a fledgling with which the bird flew away.

Sometimes other hawks appear to hunt co-operatively to good purpose. On 22 May 1917, HC Barnes (1918:13:348) was shooting with a companion near Nairobi when their dog pointed, flushed and seized a snipe; at the time the animal was fifty yards from Barnes who, on reaching it, ordered the dog to drop the snipe. As Barnes stooped to pick it up the bird flew off, so closely pursued by the dog that it was impossible to fire at the bird without hitting the dog; whilst Barnes was watching the chase, two falcons swooped past him, one diverted the dog's attention by getting between the animal and its quarry, the other seized the snipe which could be seen in its claws as the pair scared away. The incident occurred so quickly that Barnes was unable to identify the hawks but his companion said that they were "Jagga falcons"; however, *Falco jugger* is an Asiatic species and the bold birds that carried off Barnes' snipe were almost certainly one of the two races of lanner (*Falco biarmicus*) that are found in Kenya. These fierce falcons customarily hunt in pairs and have been known to take advantage of a train as a medium for flushing their quarry. One that I shot in a baobab at Morogoro was engaged in eating a chicken and, except for a gabar goshawk (*Micronisus gabar*), was the only bird of prey that I ever found molesting poultry in East Africa. Barnes said nothing as to the species of snipe but AB Percival (1914:8:141) furnishes a simple key to the four kinds - one African and three European migrants - then known to occur in East Africa. Subsequently another migrant, the painted snipe of Asia, was added to the list of East African Scolopacidae; this, of course, does not include the resident painted snipe, a snipe-like bird more nearly related to the rails despite its name and appearance.¹

The hunting possibilities of East African falcons was tested by WF Bryant who, having had previous falconry experience in Ireland, contributed an article (1918:9:16) on his attempts to catch and train a bird for hawking; the idea was suggested to him by the presence of so many different kinds of birds of prey about his camp on the Magadi Railway. First he devoted some time to observing their habits and was discouraged to find that the various species paid little or no attention to small birds but preyed on rodents; however, since they preferred rats, he used these creatures as bait and

¹ A key to the five true snipe can be found in Praed and Grant's African Handbook of Birds, 1953:371.

Kenya Casebook

soon had as many as six different kinds of hawks waiting in the trees near his tent for him to put out their food. Down they would swoop but, avoiding the horsehair noose surrounding the rat, would alight nearby and reach carefully for the bait without being caught. Chagrined, Bryant switched to the use of the common native snare attached to a bent twig which, when sprung, tautened a running noose about the bird's leg. Bryant's first capture resembled a European goshawk in size and appearance, having a dark brown back, speckled breast and pure white under the wings; to handle her, Bryant cut a blanket into long strips which he wound about his wrist and forearm for protection. Then he slipped the jesses¹ on her legs, passed the leash through and attached it to her previously prepared perch, which had been slightly padded on top, while from it depended an empty sack whose bottom corners were fastened to the ground. The purpose of this sack was to enable the falcon to climb back to her perch if she fell – as she most certainly would on reaching the limits imposed by her leash – should she attempt to fly.

At first the falcon was intractable and refused all food but, towards the close of the third day, she accepted a live mouse and ate it with Bryant standing in front of her and, thereafter, she took mice and rats freely, taming so rapidly that at the end of ten days she would look for her master's arrival and permit him to handle her. Only then was the hawk offered birds but she showed little interest in a pigeon, seemingly not recognizing it as food until it was half-plucked and cut open for her; after that she became quite eager for birds which she plucked herself. However, a considerable time elapsed before she realized that a guineafowl was edible!

Once the falcon was feeding well and thoroughly accustomed to her surroundings, Bryant began training the bird to come from a pole set up in the middle of the camp; to this pole she was attached by thirty feet of cord while Bryant, standing about ten feet away, proffered a freshly killed pigeon. On seeing it the hawk became greatly excited but made no effort to leave her perch but, bit by bit, Bryant moved closer until at last the hawk flew down to settle on his wrist, where she was allowed to feed. This procedure was repeated day after day over ever-increasing distances until the falcon would come flying to his hand from as much as forty yards away.

The next step was to liberate her. Immediately the goshawk flew into a tree and began looking for food; when shown a pigeon she straightaway sailed down to Bryant's hand. From this it might be supposed that her training was almost at an end; however, when taken out and shown wild guineafowl she made no attempt to attack them. Accustomed to being supplied with partially plucked, already dead food, the hawk showed no intention of killing prey on her own account. To teach a bird to do this is one of a falconer's more difficult tasks and would have taken so much of Bryant's time that he reluctantly abandoned the idea of further training. He told of his experiences with several other species and how he was forced to the conclusion that the prevalence of small rodents had resulted in most East African hawks being unaccustomed to hunting birds.

¹ Usually lengthy anklets with a ring attached.

Chapter 7

OF HAMMERKOPS, HADADAS AND FLAMINGOES

Relatively few people, I imagine, would wish to emulate WF Bryant by trapping and training falcons to harry other birds; furthermore, the protective laws of today forbid the keeping of many species in captivity, which is all to the good in an over-populated world whose wildlife is steadily decreasing. However, no reasonable person would complain of birds being kept in the spacious aviaries with which the dental surgeon VGL van Someren, one of Kenya's pioneer ornithologists, surrounded himself at Ainsworth House. If one must part with a tooth, or have it subjected to the discomfort of drilling and filling, by way of compensation there was always the pleasant aftermath of being taken by the versatile doctor to see some bird sitting on its nest, or the latest addition to the gaily-plumaged occupants of his aviaries. Under the title of "Rearing and Taming Wild Birds", VGL describes some of the thirty five species for which he had catered at that time (1916:9:19). Chief among those that nested freely were the gaily coloured weavers; these active birds could be tamed very quickly and were easy to feed. A mixture of wimbi, mtama and mwele – which resembles canary seed, seemed to suit them best when varied occasionally with fruit such as pawpaw; they also liked chickweed, maize and such greens as lettuce. When deaths occurred they were sometimes due to constipation induced by over-eating; other factors were anaemia, avian tuberculosis and pneumonia.

In size the occupants of the aviaries ranged from the small, seed-eating animated plums (*Lagnosticta*) to a white pelican (*Pelecanus onocrotalus*) which had been in van Someren's possession for almost two years and which, having been caught when only just able to fly, was extraordinarily tame, wandering at will through the house and about the grounds – daily it consumed three pounds of raw beefsteak. The dainty little black crakes (*Limnocolax flavirostra*) had to be provided with running water and plenty of long grass or other cover; their food – maggots, raw minced meat or boiled maize flour steeped in raw-meat juice – was put in the stream and allowed to float down with the currant. So tame did the little crakes become, they would feed from van Someren's hand. If bush-fowl are to survive, he wrote, they should either be caught as chicks or reared from eggs hatched under fowls. If captured as adults, francolin are apt to take fright and injure themselves by dashing precipitously into the netting; they attract marauders like genets and mongooses, warned van Someren who added that the wire netting for an aviary should be of half-inch mesh at most; to use anything larger is simply inviting trouble.

Other useful tips, with regard to the right amount of sun and shade in the ideal aviary, were also given. Certainly harlequin quails (*Coturnix d. delegorgusi*) did well, laying eggs though they failed to sit on them in the somewhat crowded conditions of the run and three years later van Someren (1919:14:414) had more to tell us about a pair of his harlequin quails that, with some insectivorous birds, shared an aviary from which other quails were excluded; the female began laying on 30 December 1913 and up to the time of writing had produced 113 eggs but refused to sit on them. Only when there were more than 16 eggs in the nest were any removed, twelve always being left in the hope that the little hen bird might become broody. With characteristic thoroughness van Someren preserved the entire series which, though uniform in shell texture, displayed remarkable

diversity in size, shape and colourisation.

The value of such data is obvious when one considers the difficulty of finding quails' nests in the wild, largely because of the shyness of the birds. For example, when a brooding button quail (*Turnix sylvatica*)¹ is flushed from her nest, she will run a considerable distance before taking to wing; this we were told by D McInnis (1933:47:128) who, watching from a distance, observed a quail running through the grass. The nest, consisting of a shallow scrape lined with grasses, was hidden in a dense patch of grass; it held three almost spherical eggs whose buffy ground colour was variegated with brown markings. Whilst a quail's nest is among the simplest, at the opposite extreme is the huge, three-roomed creation of the hammerkop (*Scopus umbretta bannermanni*); this stork, but little larger than a crow, derives its name from the long crest of feathers that, sticking straight out from the back of its head, seems to counterbalance the equally long and strong bill and so produce a somewhat hammer-like effect. The bill and feet are black, otherwise the hammerkop is uniformly umber brown with a purplish iridescence on some parts in certain lights. African superstitions regarding the hammerkop and its nest have been more effective in saving it from molestation than could any "Order in Council" inspired by an anxious Game Warden. In south-east Tanganyika Territory, we were told by CJP Ionides (1946:87/88:140), it is regarded as the king of the birds and "to kill one is to court certain death", it is said. Other birds are each supposed to contribute a stick to the huge nest in which allegedly lives a snake that will bite anyone who interferes with it. The protection that such beliefs have conferred on the hammerkops has, over the years, resulted in them becoming relatively tame in certain areas; of course, that was before the coming of the white man and his uninhibited offspring.

Towards the end of May 1942 a pair of hammerhead storks, whose nest had been robbed by schoolboys the previous season, attempted to build in a garden in Kyuna, Nairobi; the owner Lady Muriel Jex-Blake, who described (1943:17:278) what followed, objected to the nest being constructed in a fig tree selected by the storks and twice pulled down the mass of sticks but the persistent birds then chose a jacaranda in full view of, and about eighty feet from the veranda, where they were allowed to remain. It was early in June when they began to build on the new site and their harsh cries would be heard at about 6.30 each morning as they arrived with fresh sticks and grass; they ceased work at 10.30 am as if governed by union regulations but did a little more work at about 5 pm. By the end of the month the basin-shaped structure would have held a one year old child, for it was some thirty inches across and about thirteen inches deep; within the bowl one stork would move round and round as if smoothing it with pressure from its shoulder. Lady Jex-Blake assumed that this was the female, for this bird frequently removed and rearranged bits of the structure whilst most of the stick carrying devolved on the other bird. The roofing over process was accomplished during July when the Jex-Blakes were away and when they returned they found the nest was about five feet across and six feet high, with the entrance, though beneath the great dome, situated somewhat low down; the entrance was not just a relatively small hole as one might assume from a casual glance, but a tunnel-like passage through the thick wall of sticks as was revealed when a powerful flashlight was shone into it at night. During succeeding weeks one of the storks continued to add sticks to the roof creating a bulky structure; if any lining had been installed it must have been carried out during the family's absence in July, for no one observed any being taken in.

It is assumed that eggs were laid and the hen commenced brooding early in August for, from then on, she was seen only shortly after dawn and just before dusk. About noon each day she was visited by her mate who, on one occasion, was carrying a frog in his bill; when hunger caused the

¹ Of the race *alleni*, if recognisable (fide McInnis).

brooding bird to leave the nest it was customary for both birds to stand on the roof for a while before departing to their feeding grounds. Towards the end of September squeaks were heard emanating from the nest for the first time but the routine habits of the parent storks remained unchanged; though, as formerly, they appeared at dawn, noon and dusk, at no time were they seen carrying food to their family. Lady Jex-Blake rightly surmised that the parents regurgitated food; whether it was pre-digested is not so certain. A squawk would announce the returning parent's arrival as it alighted on the nest and there it would remain quiescent for several minutes; then, becoming restless, the stork would walk about for a while before taking the downward swoop and turn-about as it dived into the nest.

On 10 November a very tame, if somewhat ungainly, storklet appeared on a path near the nest; though it could fly a little, it preferred to walk. Two days later a slightly larger, but somewhat knock-kneed and even more ungainly youngster appeared. All day long the two of them sat on the driveway, stopping all cars for they refused to move out of the way! In due course the two young storks were joined by three others, all much darker than their parents; the five fledglings wandered about the garden paths, occasionally attempting to seize insects from the ground or accepting a worm or two offered by Lady Jex-Blake. On the morning of 14 November one of the fledglings was found dead of, it was thought, cold and undernourishment and only then did the question arise as to where they roosted at night. Watch was kept and at about 5.30 pm three of the young birds were seen to enter the nest, the fourth made three attempts to do so but, failing to negotiate the awkward entrance, sat forlornly on a nearby archway. It was not difficult to seize the lonesome storklet by the legs, then, a ladder having been procured and placed against the nest, the young bird was pushed into the entrance where it rejoined its companions. The following evening it was already late and rain was threatening before Lady Jex-Blake was able to go in search of the weakling and by the time that the bird was found it was already too dark to use the ladder, so the bird was relegated to a dog kennel for the night; there it remained quietly, warm and dry, and rejoined its fellows at about breakfast time. However one day a hawk appeared in the grounds and the wing of a storklet was found; the bird of prey was driven off before further tragedies could occur and the three remaining storklets continued to grow in peace. Each evening, till almost Christmas, they returned home to sleep and by 26 January, however, the young were not only as large as their parents but of much the same colour, so it became impossible to say whether the two birds that continued to use the nest nightly were young or old.

Generally speaking one would not expect to see hammerkops figuring on a list of birds that nested in gardens but in East Africa almost anything may happen as evidenced by FB Gough who wrote to the *Journal* (1952:91:459-452) to say that shortly after he had constructed a small pond in his garden near Ngobit, Nanyuki, a pair of hadadas built their nest nearby. When a hadada¹ ibis is seen for the first time, its bronzy green plumage gleaming in the sunshine, it impresses one as an unusual bird; this is especially the case if it is a male and one is near enough to observe that the lower half of the long, slightly curved bill is red, while the upper half is as black as the skin of the face and throat. But when the ibis, rendered uneasy by the staring stranger, spreads its wings and flaps heavily away crying "hah-hah" as if in protest at being disturbed, one is unlikely to forget the bird or its name.

At the outset FB Gough's hadidas experienced troubles similar to those of the hammerkops of Lady Jex-Blake. That first September they reared two young only to have one killed soon after it was fledged; the following March the old birds returned and renovated the nest but left without breeding.

¹ Or hadadah (*Hagedashia hagedash brevirostris*).

Back they came in September and, utilising the materials from the old nest, built a new one in which the female laid. On 22 September she started sitting, and hatched two chicks on 16 October; November 15th was a day of great anxiety for the parents who displayed considerable agitation when the youngsters left the nest but remained in the tree and returned to the nest at night. A week later both parents and young were flying about together. In March the hadadas were back again and built up the old nest, then successfully hatched and reared two more young; this would indicate that in some years at least the species is double-brooded. The hadadas of the Central Lake Region have slightly longer bills than their East African relatives and are considered as racially distinct.¹

When R van Someren, writing as “Stereo” (1910:1:44) was camped on the shores of Lake Victoria, word was brought to him that a hadada had its nest nearby. Though already late in the afternoon he set off with a minimum of delay, being very anxious to photograph the nest of this ibis as he had not seen one before; after wading through a shallow swamp he sighted the bird sitting on its nest in a small tree close to the lake. Simultaneously the ibis saw him and took wing, uttering a long-drawn out “ah-a-aaah” which, in that gloomy situation, sounded like the dismal wail of a despairing spirit. This curious cry, said van Someren, has led the Baganda to call the bird mpabaana; these people told him that once upon a time, during a famine, a woman cooked what little food she had and gave it to the children as they sat outside the hut. Her husband, on seeing this, departed crying “Give the children, give the children”; the wife called after him, “Sir, come and have your food” but the man refused, however, and, with the woman, was turned into an ibis – henceforth known as mpabaana. Hadada ibises are likely to select a tree fork at no great height in which to build their big, untidy, unlined nest of twigs. The one found by van Someren contained two young about a week old and an addled egg; normally a clutch consists of three eggs, each about 2½ (not 3) inches in length, the rather rough shell of which is blotched, streaked or stained with varying shades of reddish brown. When hatched the young are nearly nude and are jet black.

Losing no time, van Someren lashed his camera to the tree, focussed it upon the nest and set the shutter to which he cautiously fastened a long thread, the other end of which was carried by the photographer to some bushes in the shelter of which, heedless of the damp and loathsome swamp, he crouched expectantly. After thirty minutes had elapsed, with the sun sinking ever lower, despondency set in and increased until swept away by the swishing sound of wings; would the returning bird be deterred from alighting by the sight of the leaf-camouflaged object so near to her nest? No, the ibis, bearing food for her young, landed right on the nest; almost instantly, the camouflaged camera caught her eye and, filled with wild suspicions, she stood erect and at that very moment the sun broke through the clouds and the photographer, almost suffocating with excitement, pulled on the thread. At the click of the shutter the ibis vanished and hastily van Someren emerged from cover, climbed the tree, reset the camera and settled down for another long wait. But the distrustful bird did not return; probably she was waiting on the lakeshore or in some nearby swamp, her long bill probing the mud for the worms, grubs, crabs and mussels on which ibis feed; it is very doubtful if they ever take fish, at least van Someren never came across their remains when dissecting the stomachs of these birds.

With the darkness of the African night closing in, van Someren recovered his camera and tramped back home; soaking and dirty, he was strangely elated at having outwitted a wild creature and at having the possibility of having secured its portrait in natural surroundings. A quick dinner, then to the task of developing the precious negative, alternatively harassed by misgivings of failure or elated by success. Then, as each moment the image appeared more distinct, memories of the tedious

¹ Hagedashia hagedash nilotica.

wait with its accompanying cramps and subsequent fatigue faded away, supplanted by a photographer's triumphant delight as he realises that success beyond his most optimistic dreams has been achieved.

Even casual railway travellers passing through the country may get a fleeting view of the enormous flocks of flamingos that patronise East Africa's shallower alkaline lakes such as Nakuru; the aggregations of birds, forming great patches of pink, are composed of two species – the greater (*Phoenicopterus ruber*) and lesser (*Phoeniconaias minor*) flamingo. In addition to the slight difference in size, the former is characterised by having the entire terminal third of its, otherwise pink, bill, black while the upper portion of this strangely angular beak is not sunk within the lower; the lesser flamingo on the other hand, has its upper mandible sunk within the lower and only the tip of its dark red bill is black. The lesser is believed to outnumber the greater by a ratio of 20 to 1, at least at certain seasons on Lake Hannington, wrote L Brown (1955:22:159-162) whose keen interest in these birds has done so much to advance our knowledge respecting their nesting habits, to say nothing of resolving certain conflicting statements.

In September 1954, Brown attempted to reach Lake Natron colony of flamingos on foot; between shore and soda flat lay an extensive expanse of water and this he started to cross at what had appeared to be the narrowest point as seen during a reconnoitring flight. The shallow water overlay a soda crust and Brown had nearly reached the further side when his gumboots became firmly embedded in the mud; during efforts to extricate himself big chunks of solid soda invaded his boots causing severe soda burns that resulted in the ornithologist being confined to his bed for three weeks. Clearly the colony could not be reached without specialised equipment. During the preceding flight it had been observed that the aircraft had not unduly disturbed flamingos with eggs or small nestlings, though birds accompanying the flocks of larger young had taken wing rather readily. Consequently, suggested Brown, it may be possible to photograph a colony from the air without causing the birds to desert; from a series of such photographs a fairly accurate count of the nests might be made.

From the Lake Hannington observations, made between March and December 1953, Brown concluded that no successful breeding took place there, though about 4,500 nests were constructed. The nest of a lesser flamingo is essentially similar to that of the greater and consists of a shallow mud saucer about one foot in diameter, on the summit of a mound of mud from six to fifteen inches above the surface of the shallow water which, being directly exposed to an equatorial sun, may dry up before the chalky-coated eggs are hatched. Owing to flamingo eggs being sometimes found lying on the mud or washed up along the shores of these Rift Valley lakes, it had been suggested that perhaps they had actually been laid where found and incubation left to the sun! Subsequently, ran this theory, the hatchlings might be gathered up and placed in the nests for safety. Every one of the five eggs known to have been laid at Lake Hannington during 1953 had been knocked off their nests or trodden upon – only five eggs for a company of flamingos variously estimated as numbering between one or two million birds! The larger figure, obtained in July, was made during an unusual peak period for, owing to the prevailing draught, both Lakes Elementaita and Nakura had dried up.

In April and May of the following year good rains fell in the Rift Valley; consequently, when Brown visited Lake Hannington in June he found its flamingo population had dwindled to 30,000 birds which showed no sign of breeding activity. Obviously the vast flocks had gone far afield for even the combined populations of the three lakes did not add up to the number present on Hannington the previous year. Brown decided to go in search of them by plane and he did this on 20 and 21

Kenya Casebook

August, accompanied by PRO Bally of the Coryndon Museum. Cloud coverage of Ngorongoro Crater prevented observation there but at Embagi Crater Lake there was no suggestion of breeding among the line of flamingos fringing its steeply shelving shore; the latter also appeared to be unsuitable for nesting as there was no mud. Some lakes were completely dry but Eyasi still showed patches of water in one of which there were about 4,000 greater flamingos; some greater, and many adult lesser flamingos, were present on Lakes Manyara and Magadi but, again, no signs of nesting. At Lake Natron the searchers were rewarded, however, for there, among the mixed population of 500,000 flamingos scattered about the lake, they detected a very large breeding colony.

It must have been a thrilling experience for the two naturalists when they returned the following day to make a more detailed study of the situation; for one thing they discovered at least two groups – each composed of from fifty to one hundred pairs – of greater flamingos nesting at the western extremity of a vast colony of lesser flamingos. Both eggs and young were present in the nests; prior to the making of this carefully documented observation no one knew for certain that the greater flamingo nested in East Africa. A rough estimate of the total number of nests holding eggs, young, or breeding birds, was somewhere between 100,000 and 150,000; anything more precise was difficult owing to the air turbulence encountered by the aircraft while flying at 100 miles per hour over the soda flats. The effort to hold binoculars steady under such conditions made it impossible to be sure whether there were one or two eggs in each nest; Brown got the impression that there was but one. Both eggs and the young in their earlier stages were guarded by their parents and nestlings varied greatly in development, some being helpless fledglings, others downy chicks as big as a partridge.

On 20 August the naturalists saw a gathering of about 1,000 downy chicks, each approximating to a domestic fowl in size whilst subsidiary parties brought the total to around 1,500; by the following day their numbers had been doubled and, even while the naturalists viewed this astonishing spectacle they could see the vast flock being augmented by parties of young birds trekking across the soda flat. The largest group, coming from a northerly direction, was strung out for a distance of about two miles. Flying northwards, Brown and his companion passed over the scattered nests seen the previous day and then came to a huge, roughly triangular, colony comprised of not less than 50,000 empty nests; like those on Lake Hannington, they were not in a compact mass but in clumps or lines with spaces between them – they may have been even less concentrated than the Hannington nests whose density had ranged from 1.4 to 4.5 per square yard. Presumably the nests had been constructed of wet slushy mud at the edge of the soda flat but this is but one aspect of the extremely rugged conditions under which flamingos are raised on Lake Natron. Owing to the continuous evaporation of this lake, which is shallow everywhere, the concentration of salts must be tremendous; as the nestlings on Lake Hannington exhibited a desire for fresh water far in excess of adult requirements, it may be assumed that on Natron the parent flamingos have to supply the demand by fetching the liquid from freshwater springs.

The fledglings, as already indicated, trek for several miles across solid soda which would injure the skin of most animals, especially in the wilting equatorial heat without benefit of shade; by this time the young were left to their own devices unattended by their parents. One might suppose that they would fall prey to voracious birds such as the lappet-faced vulture (*Torgos tracheliotus*), Rueppell's griffons (*Gyps Rueppellii*), or a pair of tawny eagles (*Aquila rapax rapax*) that were seen on the fringes of the colony. Brown assumed that this does take place where individual birds become isolated but noted that when his plane flew low above a drove of young flamingos, the chicks ran together, their centrally directed heads pushing beneath the bodies of their companions until a compact mass was formed. Apparently this is a defence reaction evoked by the approach of a bird

of prey, but it looked for all the world like a group of rugby players going into a scrum.

On Natron the areas of red-brown algae were more extensive than the blue-green form (*Myxophyceae*) which is the dominant growth on Lake Hannington; this green algae, together with the diatoms (*Bacillariophyceae*), constitute the major items in the diet of lesser flamingos as shown by a carefully tabulated study of stomach contents made by RW Ridley, Dr BL Moss and Lord RC Percy (1955:22:147-158). For their investigation, thirty one lesser, and nine greater flamingos were collected at the various lakes, of which samples of the water content were also subjected to analysis. Their findings reveal an important difference in the diet of the two species of flamingo frequenting the alkaline lakes of Kenya. The lesser flamingos can apparently utilise any microscopic phytoplankton, though diatoms and the blue-green algae predominate; this diet is correlated with the much finer straining mechanism furnished by the beaks of lesser flamingos. In this species the entire head is rarely submerged, only the mandibles are held just below the surface as with a "scything action" the birds walk slowly through the water.

Greater flamingos on the other hand normally immerse the entire head which faces backwards towards the bird's legs as the mandible is buried in the mud; though some algae, seeds and plant fragments were present in their alimentary tracts, there was no evidence to suggest that phytoplankton were a major source of food for this flamingo. Clearly greater flamingos subsist chiefly on small invertebrates; in some lakes the larvae of chironomid flies, selectively sifted from the mud, were the staple food; small crustaceans known as copepods (*Paradiaptomus africanus*) were present in other birds. The authors had been shown a mass of gastropods (*Tympanotomus fluviatilis*) removed from the stomach of a greater flamingo killed at Port Said; they also mentioned that in India the diet of this bird is said to include small fish.

Chapter 8

CROWNED CRANES AND PLUCKY PLOVERS

In the earlier days not everyone displayed Brown's patience for detailed observations respecting the nests that they found. So it was with WM Congreve (1913:8:44) and the crowned cranes (*Balaerica regulorum gibbericeps*) which are so named because of the golden crest of strangely straw-like modified feathers that rise from a little black cap that looks like velvet, so short and soft are the feathers of which it is composed. It is further enhanced by an extensive patch of white skin on the side of the face and lower down by scarlet lappets. The body plumage is largely grey, something that one is apt to overlook because of the conspicuous white and chocolate wings.

Congreve, having observed that a single pair of these crowned cranes frequented a 700 acre glade in the Mau Forest, rightly surmised that they would probably nest there and, on 16 September 1912, he and a friend were out shooting snipe on a flat, rendered boggy by the big rains, when a crane rose twenty yards away; on the spur of the moment, for he had long wanted a specimen of this bird, he shot and killed it. Shortly afterwards in a little clearing surrounded by dense vegetation, and only a few inches above the general ground level, Congreve's companion came across a huge nest which was undoubtedly that of the dead bird. The nest, composed of wilted sedges and grass, measured 30 inches across and the slight basin in its centre was about one foot in diameter. In this lay three dirty, chalky-white eggs resembling those of an English cormorant in size and texture; one was much incubated and the other two were fresh though probably infertile and, when blown, if held to the light, the inside was seen to be blue-green. This story ends on a happier note for two days later the bereaved male had found another mate.

Possibly Congreve's experience with crowned cranes stimulated CM Dobbs (1914:8:138) to communicate his own. During July 1912, he said, a pair of these birds appeared at Kericho where they spent every day on the prison farm and were presumed to be building a nest nearby, on 20 September a young kongonyo, as its captor called it, was brought to Dobbs by a Lumbwa and, a few days later, a second, somewhat smaller fledgling, which unfortunately succumbed. For the first 24 hours the survivor had to be forcibly fed, thereafter it ate avidly of boiled rice, maize, millet (wimbi), mashed potatoes and almost anything set before it. When taken for a walk it would peck vigorously at wayside grasses, detaching the seeds by closing its beak on the stem below the feathery part and then, by a quick sidewise jerk, scraping the seeds from the stalk as it passed between the bill in which they were retained. On one occasion the young crane appeared to be distressed; inspection revealed its mouth to be full of ants' heads attached by their mandibles to the membrane but the bodies of the insects were gone and Dobbs assumed that the bird had been feeding on them. Is it more probable that the crane had been attacked by voracious driver ants (*Dorylus*), for Dobbs describes them as "big brown ants"? Apparently, at an assumed age of three months or more, this young crane could not give the rather melancholic cry of the adult which has caused this species to receive the onomatopœic name of owang from the Jaluo. When being fed, however, the young crane emitted a purring noise but, if agitated, a sound rather resembling the quacking of a duck.

Invariably the bird became quite excited when its presumed parents passed almost directly over its enclosure, something that they did daily on the way to and from their feeding grounds. Never more than one pair of cranes were ever seen about the station but several weeks after the young male had been brought in, some natives snared what was assumed to be its mother. This occurred at 8 am and by 2 pm the following day the bereaved male appeared with another mate; where she had come from remained a mystery for, until then, only a single pair was known to occur in the entire district. Dobbs' account, which is accompanied by clear photographs of his cranes, concluded with a detailed description of the very different plumages of the immature male and adult female.

Less matter-of-fact is R van Someren (1910:2:78) for he gives us something of the circumstances and thrill of discovery when describing the nesting of the water thicknee¹ (*Burhinus v. vermiculatus*). This moderately long-legged bird is as difficult to describe tersely as it is to see when on its nest, camouflaged by its colouring; in general this is stone grey above, each feather streaked with black and along the shoulder of the wing is the only conspicuous marking, a bar which is black above and white below. The white plumage of the underside is variegated on the breast by blackish streaks similar to those on the head and back.

The peaceful waters of Victoria Nyanza mirrored the brilliant morning as van Someren set out in his canoe to skirt the shore which was teeming with wildlife. Dainty ring plovers, dodging the gentle wavelets as they rolled murmuring up the beach, paused to pick up some tasty morsel, or chased each other across the sands where nimble sandpipers ceaselessly bobbed their heads. Weaver birds dominated the scene with their ceaseless chatter and activity; the embodiment of restless energy, they flew to and fro engaged in the seemingly endless task of nest building. Each was absorbed in the work of suspending a nest from the slender ambatch twigs overhanging the water, from the surface of which the nest might be but a few inches; additions and alterations went on interminably, varied when some bird, lazier or more mischievous than its fellows, was discovered slyly abstracting grasses from a neighbouring nest – then, for a moment, the owner's loud protests interrupted the normal babel of the busy throng.

It was the stealthy movements of a pair of water thicknees beside a stream that attracted van Someren's attention; he and a boatman stepped ashore and began casting about for a nest while to and fro on the opposite bank of the stream moved the uneasy birds; eventually a low call from the African announced that he had located the nest beside some reeds close to the stream. The nest consisted of a shallow, driftwood-lined depression in the sand but it held two stone-coloured eggs handsomely splashed with rich brown markings; yet so closely did the colour of eggs and nest harmonise with their surroundings that they were rendered quite inconspicuous. Within a few feet of the nest a screen of reeds was quickly constructed in order to conceal the camera, behind it in the sand a shallow trench was scooped in which van Someren could lie; his head was hidden beneath the camera cloth, his body and legs by sand heaped over them by the boatman who then retired to the canoe and paddled away in order to reassure the birds. A more comfortable hide, reflected van Someren, could scarcely be hoped for, so readily did the soft sand accommodate all bony angles of the photographer. Presently a plaintive whistle announced the return of a bird; cautiously peering beneath the camera, van Someren was delighted to observe that the female thicknee, after having made a quiet inspection of the reed screen, had apparently decided that there was nothing to fear; she approached her nest and gazed at the eggs for several seconds. Finding nothing amiss she settled down to brood until the click of the shutter sent her flying across the stream to where her mate was waiting; this was fortunate for it enabled van Someren to change the

¹ Or, as he calls it, the Central African stone-curlew (*Oedicnemus vermiculatus*); further south it is known as the water dikkop.

plate and reset the shutter.

Nine delightful photographs of the crested wattled plover (*Sarciophorus tectus latifrons*), its eggs and young, accompanied MEW North's account (1936:13:132-145) of the first recorded nesting in Kenya Colony of that handsome species. At the base of the beak, observed North, a transverse red band is continuous with the red wattles situated on either side, one in front of each eye; the conspicuous black crested cap is preceded by a white forehead and followed by a white patch on the back of the head which, narrowing on the sides, merges with the extensive white throat. On the nape, encircling the neck, is a black collar that, scarf-like, continues as a broad band down the white breast; the back is brown, the flanks and abdomen largely white and the long red legs contribute considerably to the height which is about eleven inches overall.

In Kenya this is chiefly a bird of the Northern Frontier District and it is at Garisa, where he was serving as District Officer, that North discovered these plovers nesting after the April rains. On 28 April five nests contained eggs and many more nests were found during the two succeeding months; the nest, in which only two eggs are deposited, is a mere scrape on sandy ground and the most favoured spot for the nests was a section of the aircraft landing field where areas of hard sand were interspersed by patches of short grass and débris. There, to the east of the Tana River in an area of three hundred yards where the road crosses the landing field, seven nests were found; strangely there were plenty of other places where the birds would have led a quieter life but disturbances did not seem to affect them greatly as was evident from the numerous nests situated in the most surprising spots in and around Garisa itself. One nest was within a stone's throw of the dressing station, another beside a much-frequented path less than 100 yards from the guardroom; of a score of situations the most remarkable seems to have been near the Saka rest house. This hut, perched on a bluff overlooking the river, is largely surrounded by a forest of which only enough had been cut and cleared to accommodate the building and its sandy compound; yet in this limited area, within thirty yards of the hut, a wattled plover chose to nest in full view of North when conferring with local headmen.

In such exposed spots the brooding bird has either to sit tight, relying on its inconspicuous colouring, or to run as soon as a possible source of danger is seen approaching in the distance; so far as human beings are concerned the latter procedure is the one usually adopted. Indeed to surprise a crested plover on its nest one has to come upon it very suddenly; the bird will then depart abruptly, though without going far. After walking a short distance she will pause to pick up something edible before continuing her walk, then stop briefly again and look about somewhat nervously before going on a little further; anything less demonstrative could scarcely be imagined. In sharp contrast are the tactics adopted by nesting plovers where stock is concerned; should a flock of sheep or goats approach the nest the parent bird stands her ground, shrieking defiance at the intruders and pecking at the legs of those that venture too near. North was fortunate enough to witness one of these demonstrations personally but was told by local Somalis that it was the customary procedure. In support of his account one man conducted North to a nest that had been defended in this way by the plucky plover; the site was hard sandy ground along a route traversed daily by a flock of goats. Their tracks covered the terrain to within about a yard of the nest when they diverged, passing to right and left of it for about two feet before converging again; perhaps the necessity for daily demonstrations discouraged this bird who subsequently deserted. Curiously enough, remarked North, her egg remained unharmed for a full week, after which he removed it for preservation; the discovery of one trodden-down nest revealed that those parents were either absent when the flock passed over it or else the defence is not invariably effective.

Kenya Casebook

The noisy reaction of these plovers, when herds approach the vicinity of their nests, was utilised to locate the latter by a Somali; this man would deliberately drive a flock of goats about in likely localities until the protesting parents betrayed the whereabouts of their eggs. North himself sometimes succeeded in the search by cycling at top speed towards a suspected nesting place; this approach gave the brooding bird no time to withdraw unobtrusively and she could usually be detected hastily rising from her egg. In open bush country tracking proved useful; on one such occasion when a bird was observed running away as if from a nest, North went to the place where the bird was first seen, then followed back along her tracks in the sand until they led him to the nest. At times binoculars could be used to pin-point the spot where a plover suddenly settled down, this method was likely to be most successful about noon when the birds were loath to leave their eggs exposed to the sun.

The heat engendered by the sun's rays in this region is terrific and nests of the crested wattled plover are usually fully exposed to it, being in the open without benefit of shade of any kind. Following a week of such exposure, the condition of the deserted egg removed by North could best be described as practically soft-boiled; nevertheless the heat-resisting qualities of these plover eggs must be of a high order for those of several birds, such as the one near the Saka guardroom, that were disturbed many times each day, successfully hatched without exception. During the heat of the day North noted that the brooding birds scarcely touched their eggs but shielded them from the fierce sun by squatting on their long tarsi; on such occasions, owing to the wings being slightly extended and the back feathers being fluffed out, the plover appears to be almost double its usual size. Usually, too, it is seen to be gasping with the heat; probably each parent takes a turn at brooding, the off-duty bird sheltering beneath some nearby bush.

In cool weather the eggs, or egg – for sometimes only one is laid – are brooded in the normal manner. The eggs themselves may lie in the nest fully exposed or be half-buried in its lining or, again, have only their tops exposed; under these latter conditions nests were naturally more difficult to locate, yet the custom of concealing the eggs appeared to rest on individual whims in the most erratic way – occasionally even the same clutch of eggs might be concealed or exposed without apparent reason. The essentially plover-type of subpyriform eggs varied in details to such an extent that precise description would be tedious; numerous irregular patches of dark umber on chestnut, with smaller markings of light grey, were scattered profusely over a background ranging from a light stone-shade through pale yellowish buff to warm buff, or sometimes a greenish brown. In sizes too they were diverse, not even those from the same nest agreeing; the twenty three eggs measured by North ranged from 32 x 24 mm to 37 x 35 mm, with an average size of 34 x 25 mm. As previously stated, the nest of this plover consists of a mere scrape on hard sandy ground with possibly a scanty covering of small creeping plants and a scattering of vegetable débris such as dead leaves and twigs; in diameter the scrape is about six inches and this is “lined with tiny pebbles, pieces of earth, twigs, dung and even some prickly six-pointed grass seeds”. It was in nests lined with these prickly seeds that once-buried eggs were brought to the surface, suggesting that the brooding bird may have had a sound motive for the change.

Photographing the plovers at their nest was attended by some difficulty for the risk of theft made it inadvisable to leave a hide out at night; for several successive days, therefore, it had to be set up at sunrise and taken down and brought back to base at sunset. On 12 May, at 7.30 am North entered the hide, focussed his camera on the nest and told his assistant to leave. The birds, which had been watching from a discreet distance, promptly returned but their angry cries and general behaviour suggested that they were aware that someone was in the hide; nonetheless, the urge to brood was imperative and presently one of the pair settled down on the eggs. Shortly afterwards

Kenya Casebook

the sun came out and caused the blind to cast a shadow across the nest so that only half of the sitting bird was in sunshine; though fearing that a change of position might upset the plover altogether, North saw nothing for it but to recall his assistants to move the hide to one side. While this was being done he noticed that one of the eggs had hatched; time was now so critical to the brooding bird that, despite her continued suspicion of the hide, back she came and “flopped down suddenly, waggled her tail and began to brood”. While doing so she continued to utter warning cries for a time until she was somewhat calmer. Presently a chick peeped from below her plumage but North, having taken all the photographs that he wanted, removed the camera and looked out through the large hole previously occupied by the lens. At that the bird retired a few yards but, returning quickly, resumed her brooding. Dismantling the hide with all possible speed North departed, leaving the plovers in peace.

To synopsise North’s delightfully informative account in this fashion, necessary though it has been for the purpose of this book, may seem criminal to many bird observers who have read the article in its entirety but to those who have not, the original account is commended as a pattern for the recording of such original observations.

Garisa, where North found the crested wattled plovers nesting, is a little to the south of the Equator and almost due east of Garisa and, at the mouth of the Juba, lies Kisimayo, formerly the most northerly port in British East Africa. Following its presentation to Mussolini it appeared on maps of Italian Somaliland as Chisimaio but it was still Kismayu when Fairfax Franklin wrote to the *Journal* (1919:14:497) to record an observation on the local “guinea-fowl”. Presumably he was referring to the gorgeously-plumaged vulturine guinea-fowl (*Acryllium vulturinum*) of the region. At the time a contingent of police were practicing on the rifle range some distance from the shore and the firing alarmed a covey of guinea-fowl, consisting of about eighty birds, which flew towards, and settled on, the beach. Pursued by some natives they flew out to sea for about a mile, finally dropping exhausted into the Indian Ocean where most of them drowned; the boat boys went after them and gathered up the corpses.

Chapter 9

SALIVA AS A BUILDING ASSET

The silvery-cheeked hornbill (*Bycanistes b. brevis*)¹ is a big bird by most standards, being in size comparable to an eagle; the female is slightly smaller than the male, the large cream-coloured casque on the top of her beak being neither so huge, nor so pointed in front, as that of her mate. Apart from their variegated heads, both birds are predominantly blue-black above and on the breast, while the belly, rump, upper tail-coverts and terminal portions of the outer tail feathers are pure white; the central tail feathers remain blackish to their tips.

As RE Moreau (1935:13:1-28) pointed out, this handsome species is a bird of the evergreen forests and, in the tops of these trees, often as much as 150 feet from the ground, they roost. Shortly after sunrise the flock takes off in small parties to wing their way to some fruiting tree, be it near or far, for these hornbills are almost exclusively frugivorous, though not averse to locusts when numerous, or even an occasional millipede. Wild fruits of one kind another are to be found in the Usambara forests at all times of the year, so posing no problem for the hornbills which evince a fondness for the cherry-sized stone-fruit of *Sersalis usambarensis* and also appreciate those of *Canthium* which are as big as a small apple. Nut-like fruits without flesh are taken too, including even the hard and heavy plum-sized nuts of *Odvendea Zimmermanni*.² Being without narrow nationalistic prejudices hornbills display a ready appreciation of guavas and similar exotic fruits which the alien white man has introduced at Amani's experimental research station. Whatever the kind, the fruit is seized by the tips of the bird's mandibles and, with a characteristic jerk of the head, tossed so as to fall into the receptive gullet, being swallowed entire. Despite the perennial supply of fruit in the equable climate of Amani, observed Moreau, for some unknown reason the breeding season appears to be definitely restricted to certain months, nest-building being undertaken in October and November.

On 30 October Moreau observed a female silvery-cheeked hornbill busy about a hole, in size approximately nine by twelve inches, situated at a height of eighty feet from the ground in the trunk of a big *Parinarium* and every day for the previous six years Moreau had been accustomed to pass within sight of this hole and was confident that it had not been occupied previously by hornbills. This tree was so closely surrounded by others that the nearest point from which a clear view of the hole might be obtained was from 250 yards across a valley. Daily during the following three weeks both male and female hornbills worked with varying industry at reducing the size of the aperture by the addition of mud pellets and with scientific devotion to accuracy and a studied indifference to its effect on trade union organisations, Moreau laconically remarked, "Our birds never worked for more than five hours" each day. It may reasonably be assumed that the builders had a substantial fruitarian breakfast before setting out as only once were they seen to arrive before 9 am and even

¹ Formerly known as *cristatus*, a name preoccupied by an Asiatic hornbill. Praed and Grant, besides some other ornithologists, use only binomials for this species as they do not regard the northern form (*Bycanistes b. omissus*).

² In certain matters of nomenclatorial practice botanists are a law unto themselves, clinging to the capitalisation of specific names when those commemorate a person; a procedure long-since abandoned by their progressive zoological brethren.

Kenya Casebook

so, they frequently failed to start work until 11 o'clock; usually they knocked off between 1 and 2 pm and never remained later than 3 o'clock, after which they would disappear completely until the following morning. On such days as the pair failed to arrive together it was always the male who showed up first; he would alight on the boss above the hole and exhibit a quite comical concern, repeatedly bending down to peer inside. When his mate eventually came she usually entered the hole without delay, for practically all the actual construction work was done by her from the inside with materials supplied by the male; at this Amani nest the movements of the male were difficult to follow on account of the density of the foliage but at an Ngua nest it was possible to follow his actions more readily.

The male was observed to settle on the ground, particularly dry at the time, from which he picked up and swallowed earth four times, the last being quite a beakful that he had difficulty in swallowing; then, taking a fifth lump in his bill, he returned to the hole to disgorge ten pellets. On another trip he gathered about a dozen pieces of earth which, with yet another in his beak, he flew back to present sixteen pellets to the plasterer. After each absence, usually lasting from fifteen to thirty minutes, he was seen to have some difficulty in rising, either directly to the nest or first to a nearby branch; on reaching the hole he clung with his claws to the lower side of its natural rim, his spread tail pressed against the tree trunk for additional support. At the Amani nest, however, the male settled on the upper boss so that he was in danger of losing his balance each time that he leaned down to pass in pellets, apparently always preceded by a lump of dry earth. Formerly it was assumed that these pellets were natural mud, but only rarely did a hornbill obtain his material from swampy ground; indeed, it is a relatively dry time of year in the Usambaras when hornbills set about their plastering. The mud theory appears to have been disproved by the observations of Moreau and his associates, which reveal that the basis of the pellets is lumps of earth, broken up, moistened and fashioned into pellets by some internal mechanism as yet unstudied. Apparently the transformation is rapid for, once after an absence of only five minutes, thirty three pellets were disgorged but, on the other hand, the same bird, after idling on its branch for 35 minutes, commenced disgorging pellets which, after so long an association in his gullet, might reasonably be supposed to have amalgamated. Yet the pellets were more or less spherical or ovoid with diameters ranging from one inch to about half that size; Moreau observed that the clay soil of the region cannot be used for pottery as it fails to "bind" when moistened with water.

To disgorge a pellet the male hornbill would first bow down his head and "heave" until some clay reached his throat and, then, a rapid chewing motion transferred it to the tip of his monstrous beak where it was held as deftly as in a pair of forceps until presented to the female as she sat in the hole. At times she would be too busy to accept the proffered pellet immediately, whereupon her mate, instead of dropping it into the hole for her to retrieve later, retained it in his bill until she was willing to accept it. In addition to frequently bending over to see if the female was ready for another pellet, the male constantly stooped to look in the hole and see how the plastering was progressing. At times his impatience would get the better of him, then his see-sawing motions were truly comical to behold for following each fruitless inspection he could scarcely wait to regain his upright posture before his head would go down for another look. Yet the care that he displayed in the entire operation greatly impressed all observers, not one of whom ever saw a pellet dropped or lost.

Owing to the many unaccepted profferings it was necessary for the watchers to use binoculars in order to ascertain correctly the number of pellets utilised by the female; those disgorged by the male at each visit ranged from three to forty two, the average being twenty. However, the number of trips made during the course of a day varied also; in his most industrious moods the male was seen to deliver 142 pellets in seven visits, 200 in nine, 217 in eleven and 235 in fifteen; the last being his

record achievement. Sometimes towards the end of a day the plasterer's mate seemed to have difficulty in bringing up the pellets and, on one occasion, with his head at all sorts of angles, it took the male fully five minutes of gulping motions before the eighth pellet was produced; the remaining seven of that series of fifteen also gave him some trouble. Apart from the lump of dry earth which apparently preceded every fresh gift of pellets, the latter were not the only material employed in the closing of the hole; on one occasion a stick, estimated by Moreau to be one foot in length by two inches in diameter, was passed to the waiting female. At other times less readily recognisable items, but seemingly scraps of bark, moss, lichen or other epiphytic growths. Curious as to the precise composition of hornbill-plaster, Moreau obtained a fragment from an old nest-hole; except for some pieces of bark, it appeared to be composed solely of earth, yet unfriable and so astonishingly hard as to be almost cement-like in its consistency; chemical analysis revealed no trace of nitrogen or uric acid.

Except during their preliminary visits of inspection, the role of the male hornbill was at all times confined to external duties. On 27 November when the hornbill arrived at the site, the male alighted on his usual perch, the boss above the hole, whilst the female endeavoured to enter but, failing, looked up to her mate above. Placing his beak behind her neck, he gently pushed her head into the hole. After more unsuccessful struggles to get in she removed her head again and raised it towards his; at first he ignored her and, unaided, she once more tried to enter. This time, when almost in, she was given a push from behind by the male who, using his casque for the purpose, stooped down to supply the force necessary to crown her efforts with success.

During the last stages of construction the female was seen to force herself out of the shrinking hole in order to add some finishing touches to the exterior or, by thrusting her head back in, do the same for the interior while clinging to the outside. Previously it had been customary for her to settle in the hole shortly after arrival and there remain until the conclusion of the work period of about four hours; during this time it was quite exceptional for the male to bring her any food – until the day of her incarceration. That day supplies of fruit alternated with the deliveries of pellets to be used in the final phases of plastering; the fruits were regurgitated in precisely the same fashion as the pellets. Thereafter, during the approximately four months of the female's self-imposed incarceration, the male visited her many times daily and rarely without bringing a gift of fruit. It was observed that the imprisoned female and her offspring maintained a strict silence until the male arrived at the hole whereupon, presumably emanating from the mother and nestling respectively, grunting and piping could be heard. The narrowness of the aperture rendered observation of the captives impossible but the food offerings were always taken promptly and it was noticed at least on one occasion that the grunting ceased abruptly during the transfer of a large fruit.

Unusually large fruits were brought in the male hornbill's beak, while those of moderate size were carried in his gullet as the pellets had been; the bulk of these offerings consisted of cherry-sized stone fruit (*Sersalisia usambarensis* and *Polyalthia oliveri*), the larger of the introduced passion fruit (*Passiflora edulis*), fig (*Ficus* sp.) and other species. Though generally possible to see the size and colour of the fruits brought, their identification was achieved by searching around the base of the tree for the occasional ones that fell during transfer; such showed no signs of digestion, though they might have been retained in the male's gullet for as long as 35 minutes. Only when he was at the nest was there any indication that the hole was occupied, except that – at frequent intervals – some small object came hurtling out, glinting in the sunlight as it fell to the ground; these objects proved to be perfectly cleaned, still moist stones of mbambe (*Polyalthia oliveri*). Apart from such ejecta there was but scanty trace of excrement; as the male never took anything away with him, Moreau was left speculating about the sanitary arrangements of the prisoners, one of whom had occupied

the hole for almost four months.

Towards the latter part of December, with the hatching of the egg, inferred by a noticeable increase in the number of visits paid by the male, the supply of food was stepped up; however, on 16 February and again on the 19th, a significant decrease was noted. On the first two visits of the 21st nothing was brought, possibly a gentle intimation that it was time for her ladyship to shift for herself. As soon as she started to break her way out that day, the male returned and presented her with some fruit. The silvery-cheeked hornbill's method of nesting is rendered exceptionally safe from predators by a combination of protective factors; the position of the selected hole, the unusual strength of the plaster wall, the narrowness of the slit left in it and, not least, the uninterrupted presence of the mother with her great beak. In summing up, Moreau, whose much fuller account should be consulted by those interested in details, remarks that, quite apart from demonstrations of affection, each mated pair of hornbills revealed an unusual degree of awareness of each other personally and that besides the considerable cooperation that they displayed, their nesting activities appeared to be more deliberate and less mechanical than those of smaller birds.

Astounding as is the extensive employment of saliva in the hornbill's huge "cement mixer" in the interests of his family, no less remarkable is the use to which saliva is put by a relatively tiny swift - from the end of its brief beak to the tips of its elongated tail feathers, or sabre-shaped wings, the southern palm swift (*Cypsiurus parvus myochrous*) is about six inches. Towards sundown flocks of these sooty brown birds may be seen darting hither and thither while uttering their high-pitched chattering calls; usually such flights take place in the vicinity of palm trees, borassus or coconut, which play a vital role in this swift's peculiar nesting habits. These formed the subject of another of RE Moreau's valuable contributions to the Journal (1941:15:154-170). Despite the obvious sociability of palm swifts when hawking for insects, Moreau¹ did not consider the birds to be necessarily colonial in their nesting; at Amani in the eastern Usambara Mountains, where his observations were made, a single palm might hold but one or even several dozen nests. Their construction was undertaken in a distinctly leisurely fashion, feathers being added at infrequent intervals over a period of about ten days; presumably such feathers are captured in the air for these swifts are not known to take anything from the ground. Building takes place all year round, thought at Amani it is between December and June that the majority of birds are in moult. The downy breast-feathers of doves (*Streptopelia*, *Turtur* and *Tympanistra*) appeared to be preferred but every nest held one or more of the bright feathers of the local green pigeon (*Treron australis wakefieldii*). Also identifiable were feathers of many other birds – bunting, coucal, drongo, circle, starling and weaver; while feathers provided the bulk of nesting material at Amani, usually some vegetable floss was present in the nests and might even comprise almost half of the total material used.

Actually a palm-swift's nest is nothing more than a small elongate patch of floss and feathers, cemented one at a time by saliva to the smooth vertical surface of some pendant palm frond; fronds of the borassus and dom-palms (*Hyphaene*) offer better overhead protection than do those of the coconut- and oil-palms. At times a false palm (*Dracaena papahu*) may be requisitioned while, surprisingly enough, in the Upper Uelle, the Congo race (*C. p. brachypterus*) occasionally resorts to nesting in the thatch (presumably palm-thatch) of huts. At Amani one of the most favoured sites was provided by an introduced *livistona* palm, a species with borassus-like fan-fronds; surrounding the trunk at a height of thirty feet from the ground, dead and dangling fronds formed a compact mass some seven feet in diameter and so closely packed were these fronds that even a strong breeze entirely failed to move them; at the lower end of this cone-like structure were numerous

¹ Using the name *Cypselus parvus myochrous* (Reichenov)

openings into which the swifts could rise. About this retreat scores of swifts might be seen circling and darting at all hours of the day, while their many droppings had killed the patch of grass immediately beneath it. In the heart of the structure were the remains of many old, but no recently used, nests; the newer nests were all situated towards the periphery of the mass, about fifteen of them in the sixty fronds that Moreau subjected to careful scrutiny on the basis of which he estimated that the one palm held almost 100 palm-swift's nests during the season. The attention paid to this colony resulted in some of the birds moving to four younger palms where, building at heights of from six to fifteen feet from the ground, they established one, two, seven and twenty nine nests respectfully.

Naturally what went on at these lower nests was more easily observed. At right angles to the lower edge of each flat pad was attached a flange of feathers well-bound with saliva, so relatively firm-edged. In some instances the parents continued to add feathers in a desultory fashion below the flange, thereby extending the back pad considerably and, as a result, the pads ranged from one measuring $1\frac{3}{4}$ inches long x 2 inches broad, to another of $4\frac{3}{4}$ x $1\frac{3}{4}$ inches wide. Following the construction of the curved flange, which scarcely projects more than half an inch at its widest, two white eggs are laid, each of which, its pointed end resting on the flange, is carefully cemented to the flange with saliva, frequently to the back pad as well. The surface texture of both pad and flange being so loose and fluffy, however, that the egg is far from rigid, though without being glued in this way it could not remain in the nest for a minute; it seems likely that the flanges of East African myochrous afford less protection than those of palm-swifts elsewhere, for Moreau invites attention to the observations of ornithologists in the Sudan and Madagascar where the flanges had been described as a shallow saucer.

As soon as a pair of birds started construction of a nest pad they both slept on the site at night and at intervals during the day they would also pay short visits to the growing pad together; the first to alight on the pad would assume the vertical brooding posture but soon gave place to the mate which had landed beside it. For most of the time that they spent side by side a wing would be extended over the sitting bird by whichever one was uppermost and sometimes the second-comer would cling to the pad above the sitter whose head would be covered by the body of the other, or else it might come to rest on its mate's back. So far as Moreau could see mating never occurred in the air but on the nest and egg-laying took place within the first three hours after sunrise, there was always a 48 hour interval between the arrival of the eggs of which there were normally two, never three as is customary with the Malagasy race (*C. p. gracilis*); however one of the ten clutches examined by Moreau consisted of a single egg.

Once a palm-swift was actually seen discharging her maternal obligations and four minutes after alighting on the nest pad, she bent her head to one side and forced her tail towards the pad; next, with her body still firmly pressed against the pad, the bird moved downwards until the white top of an egg could be distinguished just above the drab plumage of her breast. Lowering her head, with vomiting-like motions she applied saliva to the nest feathers besides the egg; this done, and still holding herself close against the pad, the bird moved her body from side to side as she clambered up the pad to resume her normal brooding position. On one occasion the brooding bird was observed repeating the performance, spreading a second lot of saliva into which she worked the egg as if to make doubly certain of its being securely cemented. Obviously palm-swifts' eggs, unlike those of most birds, cannot be subjected to the customary practice of turning during incubation which averages 20 days and is shared by both parents who often exhibit a surprising eagerness to assume their period of duty, the second bird jostling or edging its reluctant mate off the eggs without exposing them. This devotion alternates with quite astonishing periods of neglect, sometimes the

eggs were left for as much as three, even five, hours at a stretch.

The incubation of one nestling was brought to a successful conclusion on 21 February when, one hour and twenty minutes after one of the parents settled on two eggs, the bird flew off leaving a hatchling clinging to the nest pad in the vertical posture assumed by the adults; nothing was to be seen of the vacated eggshell which certainly had not been carried off by either parent. The second egg hatched between 8.14 and 9.55 the following morning and this time the bird - whether hatchling or parent is not clear from the context but presumably the latter – was seen to move its body restlessly against the nest pad, evidently breaking up the eggshell of which tiny fragments were seen falling to the ground. In this instance there were clearly no eggshells left after the hatching for the young to lower themselves into as described by Loveridge¹ (1919:14:413).² For the first three days of their life the dusky reddish-brown hatchlings remain blind and naked but within a few hours of birth they display considerable muscular activity. “Some are constantly in motion, rubbing their necks and sightless heads together, jerking their rumps and wagging their wing-stumps. Often they fling their heads sideways or backwards, even right on to their shoulders. These movements have nothing to do with the arrival of food and may be caused in part by the irritation from the nest parasites”. However, most of their time is spent in a vertical position, side by side with their heads stretched upwards against the pad in the same posture assumed by the breeding parent; in this attitude their rumps project beyond the nest flange so that their droppings fall to the ground and save their parents from the nest-cleaning duties that are performed by most birds.

By the sixth day the eyes are beginning to open and the white quill-points, already showing, quickly give rise to whitish down on the upper parts; soon the nestling is such a mass of down that it loses all resemblance to a bird, blending and merging so well with the nest pad that the whole appears as a lichen-like blob on the palm frond. When a frond is withered, or otherwise constricted, there is little opportunity for the nestling to exercise its wings, one that was closely watched did so only when being fed; yet each of five fledglings whose first departure from the nest was witnessed, took off and followed his/her parents without any apparent coaxing or compulsion.

This account of early life of a palm-swift should not be concluded without some mention of the extremely high mortality rate. Of 35 eggs under observation, four were sucked by a predator, two fell from their nest, two became addled and three were deserted; thus of 23 young successfully hatched, only six were eventually fledged. The four broken eggs and at least half of the deaths were almost certainly due to fiscal shrikes (*Lanius collaris humeralis*) which were seen at their nefarious work. The following breeding season every fiscal observed near the palm-swift colony was shot and the mortality among the young swifts was reduced to such an extent that of eighteen young in the nests in November, twelve were successfully fledged.

¹ The author of this book. (Editor's note)

² If this is customary practice, perhaps I disturbed the brooding bird before she had time to break up the shells. As I drew down the frond so as to reach the nest, the hatchlings certainly backed down until their naked pink abdomens rested in the broken cups of eggshell.

Chapter 10

OF HONEY GUIDES, KINGFISHERS, WHYDAHs AND CUCKOOS

Earlier in this century one could scarcely spend much time in the East African bush without being accosted by the vociferous chattering or twittering of a small sparrow-like bird and when its cries or fluttering had attracted one's attention, the bird would fly ahead a little way and repeat its behaviour as if to lure one on. In the course of a safari one's African bearers could scarcely be restrained from accepting the invitation, knowing that the side trip would terminate at some wild bees' nest from which they might hope to loot the much-prized honey. There is evidence to support the belief that this guiding habit was first developed by cooperation with the ratel or honey badger (*Mellivora capensis*) and only later transferred to man. This practice is indulged in by several species of birds of which the best known and most widespread is the greater honey-guide (*Indicator indicator*); not unnaturally it was generally assumed that the bird's behaviour was motivated by a love of honey, or the succulent grubs or pupae which it was unable to obtain without the aid of an ally to break open the nest.

On his part the African, after looting the honey, was careful to leave a little comb for his feathered guide and in due course the idea arose that if this was not done the disgruntled bird, having been cheated out of its due reward, would seek revenge on the next man it encountered by guiding him, not to a bees' nest but to a venomous snake or dangerous animal. Possibly the idea had its origin in the well-established fact that a bird which has discovered a cat or snake will raise an outcry that brings others to the scene. From his diary Sir FJ Jackson (1913:7:78) quotes two instances where he believed that a honey-guide had conducted him to a big cat. The first occurred at Merereni on 8 July 1886 as he and his gunbearers were following a game trail through scrub, low brush and scattered trees in search of a bull oryx that had been seen in the vicinity two days before; consequently when they were discovered by a honey-guide which began calling persistently as it flew ahead of them, Sir Frederick found its chatter particularly irritating. However, they continued on in this fashion for a quarter of a mile when the bird turned off to the right and flew to a large tree eighty yards away where, calling louder than ever, it evinced such excitement that Jackson followed out of sheer curiosity and as he and his followers reached the tree and were peering upwards among the branches, a fine serval sprang from the grass and scrub at the foot of the tree and went bounding away. The honey guide promptly ceased its chattering.

The second occasion was at Kilimanjaro on 12 February 1887 when Jackson, having left his camp at dawn, soon encountered abundance of game in great variety. Eventually he decided to stalk a herd of about 120 buffaloes that, grazing as they went, were gradually moving across a dry watercourse about a mile away; descending into the watercourse Jackson managed to get within 400 yards of the quarry when two honey-guides started calling; this made it advisable to wait awhile and later, when Jackson was within 150 yards of the buffaloes, the birds – of whom there were now three – approximately 40 yards ahead of him, became frantically excited. To their outcries some animal responded with a deep grunt, shortly followed by another; assuming that one of the buffaloes had discovered a mud hole and was enjoying a wallow, Jackson cautiously advanced towards the

spot but found only scrub and rank grass from which sprung a fine leopard which paused for a moment at the opposite bank of the ravine, twenty yards away. Hastily Jackson exchanged his eight-bore for an express rifle but the leopard made off before he could fire. The weapon was still at Jackson's shoulder when his bearer touched him saying, "Mgine, Bwana (Another, Sir)" and sure enough a second leopard, looking after his retreating mate, was now standing where the first had been; a quick shot behind the shoulder tumbled him headlong into the watercourse – dead. The birds, either scared by the shot or satisfied at having accomplished their mission, were seen no more.

A brief reference to this incident is made by Dr Herbert Friedman in his monumental study of the honey-guides¹ (page 36); after a thorough examination of all available evidence, Friedman concluded that where persons following a honey-guide stumble on snakes or encounter dangerous animals it is purely incidental and, in some instances, the result of being too preoccupied with bird-watching. That is to say that he rightly rejects the interpretations attached to such occurrences by African folklore. He reminds us that David Livingstone, in an attempt to ascertain if there was any factual basis for the belief, had questioned 114 Natives as to whether any one of them had actually been led by a honey-guide to anything other than a bees' nest; though all claimed to have been guided to a nest on one or more occasions, only a solitary man could recall having been misguided by a bird. Friedman believed that the guiding habit may be in the process of dying out; formerly ratels were diurnal in habit like the honey-guides but, owing to the hostility of man, whose numbers are ever increasing, ratels seek freedom from molestation by becoming nocturnal in areas where they are likely to come into contact with man and, consequently, it is becoming more difficult for the honey-guide to find a ratel except very early in the morning when the badger is returning from a night's foraging.

Whilst Africans formerly had the leisure to follow the meanderings of a honey-guide in search of a bee's nest, today, enmeshed in the web of our spreading civilisation, turning aside may often involve a man in being late for work and losing his job. Furthermore, when goor (crude sugar) can be bought so cheaply at the nearest duka (Indian store) he is less inclined to run the risk of being stung; so, at least in urban areas, honey-guides are discovering that soliciting aid is a useless occupation. This aid, it transpires, is not being sought for honey after all but for beeswax and grubs. As long ago as 1569 at Sofala, Mozambique, a catholic missionary observed a small bird flying through the open windows of his church to peck at the beeswax candlesticks standing on the altar; the priest, Jose dos Santos, describes the bird and its guiding habits in a book entitled *Ethiopia Oriental* that was published in 1609. This, writes Friedman, is probably the first recorded account of the habits of a honey-guide. To demonstrate whether the gastric juices of a bird could actually break down beeswax and make possible the assimilation of its fatty acids, Friedman initiated a series of chemical tests and investigations of the crop and intestinal contents of a honey-guide; it was found that it could.

Inviting attention to the frequency with which kingfishers are encountered far from water, GGL van Someren (1914:8:95) stated that in East Africa he had only seen two species actually fishing; these were the pied kingfisher (*Ceryle rudis rudis*) and the giant kingfisher (*Megaceryle m. maxima*) or "great spotted kingfisher" as he calls it. He went on to say that the reason why so many kingfishers are to be found in gardens and savannah or bush country is to be found in their diet which consists largely of grasshoppers and locusts. One of these insect-eating birds, the grey-headed kingfisher (*Halcyon l. leucocephala*), or "brown-bellied kingfisher"², forms the subject of his article which is

¹ The Honey-guides, US National Museum Bulletin, 1955, no. 208, pages viii and 293, plus I – xxv.

² For which he uses the name *semicanulea*.

accompanied by a fine coloured plate bearing an almost life-size portrait of this handsome bird. This depicts its powerful scarlet beak, white head, chestnut brown abdomen, black back and wing coverts, light blue wings and tail, rose-pink legs and feet terminating in black claws.

In June 1912 van Someren had found a pair of these birds nesting about four feet down from the top of a fifteen feet high railway embankment in the vicinity of Port Florence railway station near Kisumu; whether these birds themselves had tunnelled into the bank he could not say. For the first four inches the tunnel inclined upwards and then levelled off and ended, at about eighteen inches from the entrance, in a circular chamber some six inches in diameter. The circumference of the tunnel itself was only just sufficient for the passage of a kingfisher, so that, during wet weather, the birds' white upper plumage became stained by the red soil of which the embankment was composed; by carefully enlarging the entrance and employing a mirror, van Someren was able to examine the chamber which was devoid of nesting material. On 22 June the nest held four, almost spherical, somewhat glossy, white eggs; the mother bird, doubtless relying on the distance from the entrance for protection, sat very close and could not be induced to leave. The precise incubation period was not ascertained, for within a week the eggs hatched; the hatchlings were practically naked but grew rapidly and soon showed traces of feathers. When disturbed they made a hissing noise and, as soon as they came into feather, presented a peculiar appearance; beaks and feet were brown and the first plumage resembled that of the female.

Van Someren noted that the parent birds perched on a telegraph wire, or railway signal, from which they could maintain a sharp lookout over a limited area; while looking from side to side each bird would raise and lower its head. No sound was made until the prey, chiefly grasshoppers was sighted, then, uttering a shrill whistle, the kingfisher would dive with surprising force straight for the insect and seize it in its beak. A similar cry was made as the bird returned to its perch, against which it would beat the hapless insect until dead; this was in preparation for presenting it to the nestlings which were most frequently fed between 7 and 10 am and then again between 4 and 6 pm. Van Someren was anxious to photograph the parent birds at the nest but they were extremely timid, sometimes making a chattering noise when alarmed or else emitting a sharp, two-note, whistling cry; in order that they might become accustomed to the camera, van Someren left it in position for a couple of days. This was accomplished by driving a peg into the bank about five feet from the nest and, by means of a useful device known as a unipod, attaching the camera to the peg. Of the two birds the female was the bolder, for only on two occasions did the male ever face the camera; photography was difficult owing to the rapidity – "like streaks of pale blue lightening" – with which the kingfishers darted to the entrance of the tunnel which they then entered in a flash. Consequently several exposures showed only a bird's tail in the entrance; however, a measure of success was achieved at last as can be seen from the photographs which accompany the article. Unfortunately, as a result of the sun shining upon the caerulean blue wings and tail, both appear white in the reproductions.

In cities where a bewildering number of historical objects or architectural wonders awaited the satiated traveller, an obliging Baedeker directed his attention to the most outstanding items by marking them with an asterisk; similarly for the naturalist visiting the East African highlands who finds himself overwhelmed by so many intriguing wonders, I would say do not miss the dancing display and courtship of Jackson's whydah, an annual event most ably described by VD van Someren (1945:83/84:131). During most of the year the popular name of "whydah" or "widow" birds, by which a group of weavers is known, seems pointless; parties of Jackson's whydah

(*Drepanoplectes*¹ *jacksoni*), bearing a distinct resemblance to flocks of robust sparrows, fly hither and thither on the plains or settle to feed on grass seeds. However, with the approach of May, the adult males discard most of their sparrow-like feathering to assume a rich black plumage with tail feathers elongated out of all proportion to head and body; it is some fancied resemblance of these plumes to “widow’s weeds” that gained the group their Dutch name of whydah.

During May and June when the plains, except where trampled by game, are at least patchily covered by knee- or even waist-high grass, one is quite likely to catch sight of “small black fountains” momentarily rising above the verdure only to subside as suddenly as they appeared. Approach wearily, so as not to alarm the performer, and you will come upon a little clearing two or three feet in diameter where the dancer’s activities have flattened the grass except for a central tussock; sometimes several such clearings, each with its attendant cock whydah, will be found in close proximity to each other. For a few minutes prior to beginning his dance the bird will emit what is known as his “presence-announcing” call. Then, to the accompaniment of a special tinkling note, the whydah may rise from the ground a few inches in a series of low hops or else begin launching himself upwards to a height of two feet clear above the surrounding grass. The initial impetus for the spring appears to derive from the bird’s legs which continue to beat rapidly as he rises with half-opened, quivering wings; the head is thrown back until the beak appears horizontal, the neck feathers are ruffled conspicuously, the curved body looks somewhat like a fluffy black ball whose handsome tail plumes are so strongly arched upwards and forwards as to all but touch the back of the head – together with the two outer feathers that maintain a downward direction they form a characteristic triangular appearance.

Van Someren, who observed the bobbing birds from a blind, remarks that the descending dancer scarcely touches the ground before rising again; his graceful appearance bringing to mind the rhythmic action of the “yo-yo” spindles of our childhood. He noted also that the dancer always faced towards the central tuft and, when on the ground, would posture before it with bows and scrapes, ruffling his neck hackles and flaunting his tail from side to side as he strutted around the beaten ring. From time to time, lowering his head, he would take short runs at one or other of the recesses that he had made in either long side of the tussock and, occasionally, there might be a third recess at one end. Despite all this activity not once was the male whydah observed to perch on the central tussock, a pedestal reserved for the hen when she should put in an appearance. Until then the male had been engaged in establishing his territory which extended beyond the ring to a distance of from six to ten feet from the central tuft. With a view to ascertaining just how important a role was played by the tussock, van Someren cut one down and removed all traces of it from a ring where the owner had been dancing assiduously and almost immediately after van Someren was back in his hide the cock returned to the ring. Beyond a seemingly puzzled look at the spot where the tuft had been, he took no notice of its absence but recommenced his dancing and posturing, directing them towards a non-existent tuft! In fact the only difference its absence seemed to make for him was that between dances he was seen to crouch before, and buffet, a tussock of grass on the periphery of the ring.

For the females, however, the absent tuft seems of the utmost importance and each time that a hen, or it might have been the same hen returning, came in as if to land she flew off again, apart from one that appeared to settle in the ring momentarily, not a single female landed in the ring from which the tuft had been removed. While the cock was in the ring one hen perched on the grass outside but promptly flew away when the male whydah started to quiver and display for her benefit;

¹ As *Colius passer*.

on the other hand, even in the absence of its owner a ring complete with central tuft seemed to exert an attraction for the females. Should a hen alight in a ring the owner of which was perched in the long grass nearby, he would immediately fly down beside her and commence courting. The arrival of a hen, when dancing was in progress, promptly resulted in halting the performance – quivering and strutting taking its place; on her part the hen appeared to ignore the cock, evincing more interest in the grassy tussock and its recesses.

Van Someren found but one nest – about twenty feet from the nearest ring; the scarcity of nests in the vicinity of the rings puzzled him for on the available evidence, though scanty, he came to the conclusion that Jackson's whydah is polygamous. The nest, he says, "was one of the usual type", so I might add that it is situated somewhat low down in growing grass; stems of the latter are interwoven with the fine grass used in the construction and, though domed with a side entrance, it is a flimsy affair through which, if I remember rightly, one can get a glimpse of the pale bluish green eggs, extensively spotted and streaked with brown. A clutch consists of two or three, each measuring about 15 x 22 mm.

The Journal contains surprisingly few records for the recovery of ringed migrants, the earliest of which was furnished by JR Wood (1912:4:131) who told us that in February 1911, in a wheat field of Lord Delamere's Njoro farm, he came upon a dead stork (*Ciconia c. ciconia*) one leg of which bore a metal ring inscribed "Vogelwarte Rossiten, Germania 3491". Subsequently it was learned that this bird had been ringed the previous summer at the ornithological station, Bitterfeld, Saxony. A few years later it is noted that a paragraph in the local press announced "Mr Wood of the Forest Department" had obtained what was at first reported as a "crowned crane" on a leg of which was an aluminium ring with the words "Ornith. Kozpon, Budapest, Hungaria 8.7.14". These figures presumably indicate that the bird had been ringed on 8 July 1914.^{1 2} VGL van Someren (1919:14:416), who recorded the matter, remarked that unless the bird was a crowned crane that had escaped from an aviary, which seems unlikely, it was probably a common crane (*Megalornis g. grus*) of Europe and on migration when shot by Wood at Kepsaret, Uasin Gishu on 7 June 1915.

If van Someren's suggestion is correct, the record is of some interest for Praed and Grant (1952:311) give the Sudan and Ethiopia as the southernmost limits of this crane's range during the non-breeding season. Possibly they rejected the records as too indefinite, in which case residents of northern Kenya would do well to be on the lookout for this handsome bird which once nested in the fens of England. Adults of both sexes have red crowns with black feathers, black also are the throat, nape and flight feathers in marked contrast to the otherwise predominantly grey plumage. On the other hand no mention is made of this record in the Special Supplement to the Journal (1931:No.4:1-40) in which van Someren amplifies his earlier (1917:12:218-240) address to the Society on bird migration. However, both articles are chiefly restricted to the author's own data supported by skins.

At that time van Someren's list of migrants was comprised of 131 species with a few additional ones of doubtful status. In those days great discussions used to take place with regard to even such

¹ Except that for an American it would indicate 7 August; such unnecessary confusion is best avoided by the use of Roman numerals for the month, eg 8.vii.14 – which presents a well-balanced appearance. To me too, the sequence of day-month-year has always seemed more logical but Americans who do not agree could always write vii.8.14 if they wish.

² Readers are reminded that not only is the author pedantic when it is a question of science but also, although of British nationality, he spent 30 years working for Harvard University. (Editor's note)

Kenya Casebook

well-known migrants as the European cuckoo (*Cuculus c. canorus*) which arrive in East Africa about October but are more in evidence during their northward flight from February onwards; the arguments were complicated by the presence of two closely-related forms: the eastern cuckoo (*C. c. telephonus*), an Asiatic migrant that is well-nigh indistinguishable in the field and a resident African bird. The African cuckoo (*C. c. gularis*) is a partial migrant, being found in Eastern Equatoria from September to May; this race is parasitic to drongos, glossy starlings and scrub robins in whose nests its eggs have been found. Naturally the call of this locally breeding form is more often heard than that of its European counterpart. Fortunately the notes of the two races are distinguishable, being of a different pitch and less noisy; that of the African cuckoo is said by some to sound like coo-cuck, rather than the familiar ringing cuck-coo of the British bird.

A somewhat similar situation militates against the easy identification of the European swallows (*Hirundo r. ristica*), some of which pass the winter in East Africa; others move on to Natal but a few non-breeding individuals find conditions so congenial that they remain for an entire year. Complicating observations are representatives of another race (*H. r. transitiva*) which fly in from Palestine and the Jordan Valley; except at close quarters, when their breasts and underparts will be seen to be darker and more deeply washed with chestnut, they are difficult to distinguish from their European relatives. A third form (*H. r. rothschildi*) resides and breeds in the Highlands of Ethiopia. Yet another species, the Uganda swallow (*H. angolensis arcticinota*), is sufficiently similar to the European swallow for Dr R van Someren (1913:6:62) to have reported the latter as apparently breeding in Chagwe from April till June. The suggestion was promptly corrected by Sir FJ Jackson (1913:6:64) who later (1913:7:87 and 1914:8:147) furnished some arrival and departure dates of migrants that he had observed in Uganda during 1913. Another contributor to the fascinating subject of bird migration in East Africa was AB Percival (1911:1:101 and 1917:11:186) but lists provide dull reading, even when composed of the familiar names of hawks, ducks, snipe and down the scale to nightjars and nightingales or weak-winged warblers.

More recently AF Morrison (1945:83/84:116) discusses the simultaneous presence of three species of migrant wheatears on Nairobi Golf Course, his article consisting of comparative studies of their respective behaviour based on his own careful observations.

Chapter 11

COLOSSAL CROCODILES AND SPITTING COBRAS

In March of the year 1911 some visitors to the Uaso Nyiro discovered that the river was no longer flowing into the Lorian Swamp; indeed it had shrunk so much that there remained only a series of disconnected pools which were as much as two miles in length and which contained millions of siluroid fish ranging in weight up to a monstrous thirty pounds. In some pools the fish were packed so closely that there were more fish than there was water; to this the most incredible photographs bear witness, for from bank to bank no water can be seen. In other pools, one of which was not more than fifteen feet across, crocodiles had concentrated; one was shot and found to measure ten feet, the average length appeared to be between ten and twelve feet, and locally they were considered to be decidedly dangerous to man. Evidently rain fell somewhere near the sources of the Uaso Nyiro during the visitors' stay, for at the time of their departure the river was beginning to rise (Editorial note:1912:4L127).

A not dissimilar incident is recorded by CW Hobley (1919:14:408) who recalled that about fifteen years previously Lake Deshek Nama on the west bank of the Juba River remained dry for over a year and in the bush surrounding the dried out bed of the lake lay several thousand immobilised crocodiles. The then commanding officer of the King's African Rifles, stationed in Jubaland, took out a company of his men and shot several hundred of the reptiles at close range. Though crocodiles are both numerous and dangerous in the Juba River, Hobley did not think that they were exceptionally large. Crocodiles also abound in the northern part of Lake Rudolf as well as in Lake Baringo but are absent from the strongly alkaline lakes of the Great Rift Valley – Hannington, Nakura and Elementeita. Neither are there any crocodiles in Lake Naivasha which is not only fresh but is the home of myriads of frogs; the absence of crocodiles caused Hobley to suggest that (a) Lake Naivasha had been formed after the distribution of these great saurian had taken place or (b) life might be difficult for them in Naivasha on account of its (then) being almost devoid of fish. Whilst fish are the principal article of a crocodile's diet, at Kisumu Hobley once saw the bones of a young hippopotamus removed from a crocodile's stomach; also, when in the vicinity of the Tharaka country, Hobley disturbed a large crocodile basking on a sandbank of the Tana River – swiftly the reptile slid into the water but in its haste apparently collided with one of a school of hippopotamuses that were blowing in the river. With an angry snort, down went the hippo's head and the water began to churn with the violence of a struggle; one moment the back of the crocodile broke surface, the next it was the hippopotamus' body that appeared. The fracas lasted only a couple of minutes, however, then the hippo's head rose from the water while from its nostrils came a cloud of spray as if to indicate that all was well.

While adult hippopotamuses are normally immune from attacks by crocodiles, Hobley recalled the "well-known case" of a rhinoceros being dragged under water by several of these reptiles and he added that Africans allege that on occasion buffalo too may fall victims to the voracious brutes. Once, as Hobley was approaching the Sabaki River a few miles below its junction with the Tsavo, he observed half a dozen duck swimming about and they rose in flight as Hobley reached the bank,

Kenya Casebook

but he fired and one of the birds fell into the water which was unusually low. Seeing that the stream was carrying away the bird, Hobley waded in after it but, when only twenty feet from the duck, Hobley saw it being seized by a crocodile whose head appeared above the surface in order to do so. As the hunter hastily retreated to the bank he wondered why the crocodile had not attacked the ducks when they were swimming in the water; however, it may have been about to do so, though fish, being easier to swallow, are more to a crocodile's liking.

Remarking that he had never seen a plover engaged in exploring a crocodile's mouth for leeches, Hobley added that near Mumias he once saw a grey wagtail walking about inside the gaping mouth of a crocodile as it lay basking on a rock of the Nzoia River but he could not be certain as to what the bird was doing. Though the flesh of crocodiles is strictly taboo with most tribes, the Pokomo of the Tana River readily admit that they eat them. In Lake Jipe, where crocodiles are both numerous and dangerous, parties of natives occasionally wade across the northern end during the dry season when the water is low; they carry long staves with which they flog the water and should a crocodile venture too near they will hit it over the head with their sticks. Africans state that crocodiles are present in the beautiful crater lake called Chala which is surrounded by precipitous cliffs; Hobley assumed that the reptiles must have come from the Lumi River which is less than one mile away, but wondered how they negotiated the cliffs. It may be, as Hobley said, that crocodiles are "not known to walk great distances over dry land", depending on what significance is attached to the word "great" and to our lack of information on the subject. Someday our herpetologists may start ringing crocodiles with the same gay enthusiasm displayed by their ornithological colleagues in similar activities!

What puzzled Hobley most, however, is the presence of crocodiles in small coastal rivers which, rising a few miles inland, flow for a short period during and after the rains, then shrink to a series of isolated pools in which the crocodiles are apparently forced to seek refuge during the hot dry season. The possibility of such rivers being temporarily connected when in flood, is ruled out in most instances by the arid ridges which so often separate them. Here one might add that it is an established fact that crocodiles are sometimes carried out to sea by rivers in spate, and the Nilotic crocodile is quite capable of withstanding immersion in salt water for a considerable time – as shown by the arrival of one on Zanzibar Island during the present century. The distribution of this common species includes Madagascar and the Seychelles.

Hobley went on to say that the Baringo crocodiles rarely exceed nine feet in length and, so far as his observations go, those in the Babaki are seldom over twelve feet. While the Tana crocodiles are large, they cannot compare in length or bulk with those of the Lake Victoria basin. The largest he himself ever shot was in the Lower Sondo, Miriu River, in Nyakach – it measured sixteen feet six inches. This was originally given as 18½ feet due to a printer's error said Hobley in a later number of the Journal (1921:16:61). However, he there cites a letter from RJ Cuninghame in which that thoroughly trustworthy naturalist vouched for an eighteen feet crocodile (measured between perpendiculars) which he had killed in 1900 at Fajao, Murchison Falls, Victoria Nile, Uganda.

Also quoted is Mr B Eastood of the Uganda Railway who, when travelling from Mwanza to Bukoba in May 1905 with the Duke of Mecklenberg was told by His Highness of a crocodile measuring 650 cm, or just under 21½ feet,¹ that he had recently shot in Lake Victoria near Mwanza; an even less

¹ Failing to trace any reference to this astonishing figure in the scientific reports of the Duke of Mecklenberg's expeditions, I enquired of Dr Robert Mertens who kindly contacted His Highness. In his reply Duke Adolf Friederich zu Mecklenberg said that it was true that he had sailed from Mwanza to Bukoba in 1905 but had no recollection of shooting any exceptionally large crocodile

credible statement cited by Hobley was the shooting in 1916 of a 26 footer in Lake Kioga (Chioga), Uganda by a Captain Riddick. One wonders if this figure might not have been someone's slip of the pen or memory for 16 feet? Hobley certainly erred when he said that there is only one species of crocodile in East Africa, perhaps he was unaware that the slender-snouted crocodile (*Crocodylus cataphractus*) had already been taken in Tanganyika near Ujiji. The widespread Nilotic crocodile (*C. niloticus*) is common to all three territories but it is only recently that the presence of the Congolese race of the broad-nosed crocodile (*Osteolaemus tetraspis osborni*) has been found in western Uganda.

Crocodiles living in the Lusumu River of Nyanza Province, where they are known as ekwena to the Tatsoni and Bantu Kavirondo, bear an especially evil reputation among the local people, remarked W Woodhouse (1912:5:36). Individual crocodiles are recognised as having frequented a particular pool or reach of the river for long periods and certain saurian are said to have favourite rocks to which they resort for the purpose of sunning themselves; Woodhouse considered that there are good grounds for accepting native reports concerning them.

Of other reptiles it was the larger venomous snakes that received the most attention during the earlier days of the Journal. Thus we find Hobley (1914:8:140) commenting on a statement in a recently published book on Pemba Island by Captain JEE Craster, RE.¹ The author stated that he had examined the mouth of one of the local spitting snakes and found no fangs for the conduct of venom present in the upper jaw, the poison ducts merely terminating in two bony lumps. From this single observation Craster made the unfortunate deduction that the snake, described as khaki coloured and between three and four feet in length, utilises its venom solely for defence and not for killing its prey! Hobley very rightly questioned the accuracy of both observations and deduction.

As CW Hobley was riding a mule (1910:1:98) from Machakos to the Athi cableway near Iwai River, the young dog that accompanied him began barking at a tiny bush growing out of a termite hill beside the path and up from the bush rose a cobra, about five feet in length, spreading its hood to a width of some 4½ inches. Swaying slightly, the snake slowly drew back its head whereupon Hobley expected to see it strike the excited dog at any moment but, instead, he observed a stream of colourless liquid shoot from the snake's mouth full in the animal's face. Then the reptile dropped back into the bush and the dog rushed at it but was foiled by the twigs as the snake, after feigning a strike, slid down into a termitarium. For about ten minutes the dog seemed none the worse for the encounter then, showing obvious signs of discomfort, it began rubbing its head on the ground and 30 minutes later, when camp was reached, the animal's right eye was seen to be closed and its surroundings very swollen. Some milk was then poured into the eye which appeared to be distinctly better the following morning and a few days later the effects of the venom had quite worn off. The previous day a similar cobra, blackish grey above and lighter below, had been seen basking on a termitarium on the north side of Chumbi Hill. Hobley rightly concluded that both reptiles were what the Portuguese in East Africa call cobra cuspideras, the common spitting cobra (*Naja*

while there. He did, however, believe that he had been told that a 6 metre crocodile had been killed in Mwanza and agreed that 550 cm is a more likely measurement (translation of Dr Merten's letter of 1.vi.1956).

¹ JEE Craster, "Pemba, the Spice Island of Zanzibar", (T Fisher Unwin, 1913), pages 1 – 351, 30 photos, map. As Hobley supplied neither the author's initials or title, I sought out the volume in the Widener Library at Harvard University where its call number was Afr. 6592.1. I was amused to find that this book had been "bought with fines" in March 1914 and that it had been borrowed four times in the first three months and then never again for 42 years!

Kenya Casebook

nigricollis). Years before, on the Yatta Plains, he had wounded one that was over seven feet long; however, it did not spit but presumably came in his direction for he alleged that it then attacked him, though before it struck he was able to shoot it dead.

Stimulated by Hobley's account, EK Boileau (1912:4:134) related his own experience with a cobra at Maji Mazuri near Voi. One October evening in 1908 Boileau was dining with a friend when a commotion occurred among the doves occupying an aviary in his garden; on going to investigate the cause, a snake was found to have penetrated the wire netting and already killed three of the inmates of the cage. The snake, a reddish-orange ("bright orange" according to Boileau) displayed the characteristic hood of a cobra with a band ("green" fide Boileau) across its throat.¹ By inserting sticks through the netting covering the front of the cage, the two men managed to pin the reptile in one corner but Boileau injudiciously placed his face too near the netting, whereupon the cobra ejected a stream of colourless fluid of which a few drops fell on his khaki shirt, one or two on his lips and the rest struck his left eye. Almost instantaneously the orbit became the focus of intense pain which increased to such an extent that Boileau "was in fearful agony all that night"; there was nothing he could do except bathe the affected part with warm water. Subsequently a doctor told him that he should have floated pure salad oil into his eye; for two days Boileau was unable to use the eye and, writing four years afterwards, he was of the opinion that the sight had been materially affected by the venom.

There followed some observations on spitting cobras by SWJ Scholefield (1912:5:61) who, when living on Nairobi, was summoned to the somewhat gloomy boys' quarters where a kilo, as the Kamba called the hooded snake, was coiled beneath a bed and had already rendered two Africans hors de combat with its venom. Taking no chances, Scholefield fired and the reptile was picked up in three pieces! About five feet in length, this glossy black cobra had, to the best of Scholefield's recollection, a yellowish throat. On another occasion a smaller cobra appeared on the veranda of a house near the Nairobi Polo Ground and when Scholefield fired at it with his revolver, the shot swept the snake off the veranda with a broken back. Despite its injury the reptile spat at its assailant as he approached but, being young, its venom carried only a couple of feet. The olive-brown or copper-coloured cobra is known to the Kamba as kinga² and Scholefield, having seen one or two natives fearlessly handling wild (as distinct from captive) cobras and puff adders, wondered how their seeming immunity is acquired. He arranged for one of these African experts to collect snakes for him but the man, overcome by the charms of a local lady, eloped with her and her husband's cashbox.

In 1912, when Sir FJ Jackson (1913:7:77) was stalking some roan antelope between Nimule and Gondokoro, a gunbearer drew his attention to a "bright green snake" that he had disturbed but passed without noticing; the reptile was within ten feet of them, resting on some chest-high scrub beneath a large and shady tree. From time to time the snake turned its head, which was raised one foot above the scrub, from Jackson to the gunbearer, then back again; this action was unaccompanied by any lateral movement of the body, of which only three feet could be seen. Jackson estimated that at least another three feet was concealed; the hood, which appeared to be about 4½ to 5 inches in width, was distinctly more blue behind than the head or body, possibly due to the skin between the scales being that colour.³ Sir Frederick added that in Buddu he had shot a

¹ This is the red race of spitting cobra (*Naja nigricollis pallida*) inhabiting the red murram country from Longido north through the Kibwezi – Tsavo – Voi country to Lake Rudolf; the rich red colouring fades on preservation, hence the name "pallida" based on a museum specimen.

² Both these colour forms are currently known as *Naja n. nigricollis*.

³ This description fits that of a mamba, except for the width of the hood which may be due to faulty

Kenya Casebook

dark green mamba (as opposed to a cobra) measuring exactly seven feet; this snake, after being incapacitated by a shot, had every opportunity to raise a hood but did not do so. CW Hobley (1913:6:61) remarked that the scarcity of mambas in East Africa is a matter for congratulation and that during the many years that he had been in Kenya he had only heard of three being killed. One¹ in Kavirondo, another² at Mkindu and a 9 feet 3½ inch specimen³ in the Boran country by RJ Storey when en route from Nairobi to Ethiopia.

Because of the public's confusion with regard to the species of mambas in eastern East Africa, Loveridge⁴ (1947-8:89:251) furnished a synopsis of the characters that would enable one to differentiate between these dangerous snakes, one of which – the so-called “black mamba” does appear to be aggressive at certain seasons.

Common or green mamba Dendroaspis angusticeps

Inside of mouth white to bluish white
Scales around middle 17 – 21
Shields from throat to anus 201 – 232
Paired shields beneath tail 99 – 126

“Black” (green or brown) mamba Dendroaspis p. polyepsis

Inside of mouth bluish grey to black
Scales around middle 21 – 25
Shields from throat to anus 242 – 282
Paired shields beneath tail 105 – 127

The article is accompanied by a list of all localities in East Africa from which reliably identified mambas have been obtained. The black mamba, together with its northern form, is shown to range from British Somaliland and Ethiopia south through Uganda, Kenya and Tanganyika to Natal, northwest through the Transvaal, Northern Rhodesia and Bechuanaland to Southwest Africa.⁵ The green mamba ranges through Kenya, Tanganyika and Zanzibar south through the Rhodesias to the Natal and Pondoland in adjacent Cape Province.

CJP Ionides, who had previously caught more mambas in East Africa than anyone else, remarked (1946:87/88:137) that in the Southern Province of Tanganyika Territory the common, or green, mamba (*Dendroaspis angusticeps*) does not normally appear to be aggressive and, even when cornered in a hole from which there is no escape, three large mambas allowed themselves to be noosed and extracted without showing any fight. Then, as if by way of offering a corrective to our tendency always to think of snakes in the role of aggressors, Ionides (1946:85/86:70) relates how, on 12 December 1945 in a bush at Liwale, he had seen a white-headed black-chat (*Thamnotia a. arnotti*) in whose beak was a one foot long spotted wood-snake (*Philothamnus s. semivariegatus*); as Ionides approached the bird, it flew away dropping its prey – the harmless little snake was still alive but died shortly afterwards from the injuries inflicted on it by the chat. Only a fortnight before, also at Liwale, Ionides had seen a pair of black-headed bush-strikes (*Tschagra s. senegalensis*) fluttering excitedly about some object in a tree and a few minutes later a vine snake (*Thelotornis kirtlandii capensis*), about 40 inches in length, tumbled to the ground. The reptile, bleeding from the eyes and mouth, was suffering from injuries to its head and died about ten minutes later; one might

observation or recollection.

¹ Very possibly the Kaimosi mamba (*Dendroaspis jamesonii kaimosae*).

² Almost certainly a common mamba (*Dendroaspis angusticeps*).

³ Probably a form of black mamba (*Dendroaspis polyepsis* subsp.).

⁴ The author of this work. (Editor's note)

⁵ It just enters the eastern Belgian Congo at Mahagi Port and has since turned up in the southern Sudan and at Dakar, French West Africa; so strange a distribution that one wonders if two living snakes had not escaped in transit.

Kenya Casebook

add that this cryptically coloured reptile preys chiefly on chameleons and lizards, though is not averse to taking nestlings or small birds that venture within striking distance as, extended and twig-like, the snake waits motionless among the branches.

This habit of cryptically coloured snakes remaining immobile is responsible for the many deaths caused by the saw-scaled viper (*Echis carinatus pyramidum*) the particular habit of which is to lie semi-submerged in sandy or dusty soil which constitutes a menace to the bare feet of humans. For *echis* resents being trodden upon and is quick to retaliate; fortunately, in East Africa, the range of this relatively small and sluggish reptile is restricted to the arid regions of northern Uganda and Kenya. It was the capture of a 16 inch specimen at Garissa that stimulated Professor A Toschi (1946:87/88:134) to describe the viper in some detail and he did so prior to the making of the cast of it that is now on exhibition at the Coryndon Memorial Museum. Viewed from above, wrote Toschi, this viper was a pale reddish-buff with the two superposed Y-shaped markings on its head and a triple series of dark-edged, whitish spots along the back and flanks, together with some additional zigzag markings along either side; below, the reptile was uniformly white. Unfortunately Toschi, not being conversant with herpetological literature, was unaware that the saw-scaled viper had been taken at Garissa six years before; furthermore, as long ago as 1929 I had reported on specimens from Dussia, northern Uaso Nyrio and Lake Rudolf that had been taken in 1912, although unrecorded at that time, by members of Theodore Roosevelt's expedition. These and other observations communicated by myself, appear to have been mislaid by the then-editor for five years, but were eventually published (1952:91:54 = 461).

An interesting note on another dangerous viper was furnished by Ionides (1946:87/88:137) when describing the behaviour of two Bibron's burrowing-adders (*Atractaspis bibronii rostrate*) that he had captured; These unviperish-looking, uniformly black snakes have, as an adaptation to burrowing, small heads that are no bigger in girth than their bodies. On the other hand their poison fangs are enormously developed, so much so that in bygone days there was much discussion as to whether these egg-laying adders could open their mouths wide enough to erect such long fangs. Ionides' captives were observed to place their heads upon the object to be attacked whereupon there was apparently a slight contraction of the lower jaw so as to enable the needle-like fangs to be brought down on either side of it; finally the head was suddenly pressed down as it was withdrawn, an action calculated to embed the fangs or at least to scarify the flesh.

A Masai herdsman, tending the flocks of Francis Burmeister (1910:1:57) on the shores of Lake Naivasha, saw a small snake hanging on to the nose of a half-bred lamb; promptly killing the reptile, the African ran to tell his employer who happened to be in the vicinity. On arrival Burmeister first examined the snake which he was quite certain was a young puff adder (*Bitis arietans*) about 18 inches in length. Turning to the lamb, he observed beads of blood upon its nostrils where the fangs had struck; momentarily expecting the animal to collapse and expire in convulsions, he expressed surprise when nothing of the kind occurred. Indeed, after subsequent swelling of the head and neck, the lamb recovered. Obviously the adder, being immature, had been incapable of injecting a lethal dose for an animal the size of a lamb.

The Masai, with a Native's ready explanation for every event, remarked that as its attacker had been killed so promptly the lamb would recover, had the snake managed to escape the lamb would have died!

Chapter 12

TORTOISES AND THEIR DIET ¹

At some time or other most lovers of the out-of-doors in East Africa must have come across an eastern leopard tortoise without being aware of its correct scientific name (*Testudo pardalis babcocki*);² its yellow shell richly ornamented by radiating black markings, it is indeed a handsome creature. Furthermore, it is by far the largest of the three kinds of wholly terrestrial tortoises inhabiting British East Africa, for in size the adults surpass the largest solar topee worn by the most timid of sun-shy settlers.

Two females, weighing 37 and 41 pounds respectively, together with a male scaling at only 18 pounds, were kept as pets by Mrs Beryl Leakey³ of Nyeri who gave a delightful account (1944:79/80:396) of their activities; they displayed astonishing appetites, eating vast quantities of sweet-potato tops, and it was by no means unusual for a single tortoise to make a meal of an entire hard white cabbage. No wonder that during the two and a half years as guests of Mrs Leakey, one of the females more than doubled in weight.

Mrs Leakey described the courtship of the persistent male who, on occasions, would follow a female to and fro round about the enclosure for as much as several hours before being permitted to mount her and, when this was achieved, the reptile's long neck would be fully extended as he emitted a husky cry that might be heard from quite a distance. One day, at the beginning of the cold and misty season, a female was observed standing on three legs whilst she employed the long claws of her free foot to scrape a hole, digging out the earth and tossing it to one side; after a while she

¹ It is interesting to note that when the author was a child his family had numerous pets, one of which was a tortoise; hence, to quote the author's childhood memoir: "... a western spur-thighed tortoise (*Testudo g. graeca*) that my brother Alec, when 11 years of age, had brought back from Bône, Algeria in 1890; the year before I was born. Occasionally my brothers took pleasure in reminding me that I was junior to 'Bona', as we called this humble reptilian resident of our garden. Buttercups and dandelions, indeed almost any yellow flower, were his favourite food, with lettuce as a staple in his diet. Each autumn, after straw had been spread on the strawberry beds, the tortoise would dig an elongate, but shallow, burrow in which to hibernate. Then we children would be sent to seek his hiding place and heap more straw upon the spot to provide additional warmth until he would emerge the following spring. After Bona had spent seven solitary years in this fashion, I bought two other tortoises of the same kind to keep him company; Bona welcomed the new arrivals by butting them with his shell, so vigorously in fact that the resulting noise could be heard 50 yards away, and at times he would bite one or other of them fiercely. We did not then realise that this was his testudinarian method of wooing. Bona and I grew up together until he died at a ripe old age of which the last 23 years (10 July 1890 – 3 April 1913) had been spent in our garden. His remains, now literally in the best of spirits, rest (identified as MCZ 18161) in the reptilian reference collection of the Harvard Museum of Comparative Zoology". (Editor's note)

² Today the south-western form (*Testudo p. pardalis*) is apparently confined to an area in southern Southwest Africa, though formerly its range may have extended to the Cape of Good Hope.

³ It is not clear which member of the Leakey family this is. (Editor's note)

shifted her stance but continued scooping the soil with the other hind foot. This alternate resting and use of the hind feet continued until the tortoise encountered a stone whereupon the resulting frustration caused her to abandon the site and begin all over again a short distance away. This time she was more fortunate and succeeded in excavating a flask-shaped cavity "about twelve inches"¹ in depth. No sooner was this arduous task completed than she commenced depositing a large batch of round white eggs which resembled ping-pong balls but slightly larger, their shells a little thicker than those of a hen's egg.

No sooner born than buried, for without as much as a look at her eggs the mother started returning the loose soil to the hole, pushing it in with her hind feet which were employed alternatively before and, not until the site was level with the surrounding ground, did the tortoise wander away, her work done. An undertaking that, including the false start, had occupied her for ninety minutes. Exactly how many eggs this tortoise laid can only be estimated from the fact that, shortly before, her companion had deposited thirty; this was learned when her nest was discovered by a dog who, having scratched away the soil, was found eating the eggs. Already three had been devoured, twenty seven more were removed from the nest hole.

At the time of writing none of these eggs had hatched, so I wrote to Mrs Leakey for information regarding them; she very kindly replied that, after removing the eggs from the nest she packed them in sand in a gasoline can which she placed on a cement hot-water tank. Nine months later, sometime between 14 and 21 December, there emerged a single hatchling weighing half an ounce, and as no others appeared during the succeeding three weeks, the rest of the hatch were examined – only two held young tortoises, both of which were dead.

Those who have endeavoured to keep very young tortoises through the winter months of a temperate climate, have often been dismayed to find the shells of their captives softening towards the margins. In part, at least, this condition is due to the absence of ultra-violet rays and the lack of calcium; consequently Mr PRO Bally's experiences with an eastern leopard tortoise constitute a really important addition to our knowledge of what a captive tortoise should be given to eat. Mr Bally (1945:83/84:163) observed one of his tortoises take up a chicken bone twice as long as its own head and swallow it whole; the bone was devoid of meat. Some days later the reptile was found nosing and pushing around a much larger bone and, after Bally had smashed this bone, the tortoise seized the jagged splinters, one of which was 1½ inches long, and swallowed the pieces till all were gone. Thereafter the reptile's vegetarian diet was supplemented by a daily ration of bone splinters upon which it thrived, as we learned from a later article on the subject that Bally contributed to another publication.

¹ This suggests an exceptionally long reach of the hind leg, eight inches would be nearer the usual depth.



Christmas Day, 1933. Arthur Loveridge on safari at Sipi, Uganda with his son, Brian, his wife, Queenie, and his table boy, Ogutu.

The photograph was taken by head boy Paulo using the author's Rolleiflex camera.

Chapter 13

THE LUNGFISH OF LAKE VICTORIA AND THE FISHING INDUSTRY

Not unnaturally fish and fishing receive considerable attention in the Journal where some thirty articles are devoted to the subject; to most naturalists, however, few will compare for interest with the early accounts of that strange survival from a bygone age – the African lungfish. A creature whose adaptations not only enable it to counter the annual dessication of its habitat during recurrent dry seasons, but also to endure exceptionally prolonged periods of draught lasting for a year or more.

RJ Cuninghame, after having mentioned (1913:7:82) that in 1898 he had unsuccessfully tried to transport a living lungfish (*Protopterus arthiopicus*) from Lake Victoria to London, went on to congratulate CW Woodhouse, Assistant Game Ranger, on having accomplished this difficult undertaking. Woodhouse, on learning from the natives of the existence of a fish which buried itself in mud at the onset of the dry season, had become interested; then one day he observed two small boys industriously digging in a dried-up swamp near the Kibos River, Kisumu. For seven months there had been no water in this swamp, so it was hard, peaty mud that the youngsters were excavating until they unearthed a fish; in the hope of securing a live one Woodhouse arranged for many boys to come the following day and search for the aestivating lungfish. The presence of a fish was indicated by a crater-like aperture in the mud among the papyrus roots and into this opening one of the older boys thrust a papyrus stalk, then, withdrawing it, pass the stalk to a small boy to smell - this because of a belief that the olfactory organs of a young boy were the more acute. Should a fishy smell be detected by the probe, any papyrus surrounding the little aperture was cleared away and digging operations commenced. Each lungfish was enclosed in a fairly hard, mucus-lined, mud cocoon or chamber containing at most a tablespoonful or two of mixed mucus and water, though sometimes powdery and dry; one fish was observed to take some earth into its mouth and then eject it in the form of a soft pellet.

Cocoons were usually found at depths of from two to three feet and within each a fish lay curled, its head directed upwards, the mouth covered by its broad tail. Upon being exposed a fish would emit a short sharp grunt and snap viciously at anything coming near it; making protesting snaps, one lungfish was removed to a bucket of water from which it twice bit a finger that was incautiously approached too near to the surface. This specimen was about two feet in length, so scarcely half-grown, for adults measure four or five feet overall; presumably Woodhouse added mud to the water and then let the turgid solution dry out, for we read that the fish was transported in mud to Regent's Park Zoo, London where the only large tanks – two of them - the temperature of which could be suitably regulated, were already occupied by a pair of Australian lungfish (*Ceratodus forsteri*) that had been in residence for fifteen years. Into one of these tanks the newcomer was dumped; it had lain quiescent in his mud cocoon during the long journey and was soon activated by the warm water. He began moving over the gravel-strewn bottom of the tank by alternate "steps" of his slender, filament-like, six inches long, pectoral "fins" and, by undulations of his tail, he was soon swimming about and it was then that trouble began. The moment that *Protopterus*' snout came in contact with

the tail of a *Ceratodus* he made vicious snaps at his big Australian cousin; the latter showed no inclination to defend itself and the authorities, unwilling to run the risk of having *Ceratodus* injured by *Protopterus*, had the African lungfish placed in another tank whose occupants had been removed to make room for the aggressive newcomer.

In its eel-like, cylindrical shape *Protopterus* differs markedly from *Ceratodus*; though the scales of both genera are essentially similar, those of *Protopterus*, being covered by skin, are less distinct and the lateral lines of sense organs, as well as the curved lines on the head are conspicuous. One interesting feature is the presence of an anterior and a posterior pair of nasal openings – as in land vertebrates – but in the lungfish both pairs are behind the upper lip; an African *Protopterus*, instead of having the single lung characteristic of the Australian *Ceratodus*, has a pair to fill so makes frequent trips to the surface to do so. Sir FJ Jackson, who was familiar with the maruba, as the Baganda call the lungfish, told us (1910:9:3) that on a perfectly calm day the placid surface of Lake Victoria is frequently broken by the snouts and parts of the heads of maruba and, occasionally, one may be seen to gape widely as if yawning.

Near Entebbe, where a vast swamp separates Bussi Island from the mainland, Africans have cleared a narrow, 25 feet channel of open water to enable their canoes to reach the island; the water in this channel is less than one yard in depth but the underlying mud, formed of decomposing vegetation, is so deep that a ten feet pole fails to touch the bottom. Jackson assures us that with the help of such a pole and the exercise of considerable caution, it is possible to wade about in this swamp. However, one's preoccupation with personal hazards are such that he does not recommend the procedure for truly objective nature study! At the boggy head of this swamp in August 1915 Jackson came upon and photographed two lungfish nests of recent construction and both were situated in a patch of coarse grass and both had a depth of about 18 inches and a diameter of from 2½ to 3 feet, being circular in shape. Within each circle the water was perfectly clear; the vertical sides of each nest were presumably supported and sustained by an interlacing network of fine grass roots upon which was a deposit of mud that was so susceptible to the slightest disturbance that the insertion of one's hand, or even a reed for that matter, resulted in the water becoming so turbid as to prevent further observation.

The boundary of each nest was forced by a ring of mud about four or five inches broad, protruding one inch above the surface of the water; the mud did not appear to have been pushed up from below but to have been deposited from above and then smoothed down, so firm and shiny was its surface. Jackson suggested that the lungfish may have brought up the mud in their mouths and, after depositing it, smoothed it down with their slimy, eel-like tails with results that appeared more like human handiwork than the achievements of a fish. Additional information was provided by Hugh Copley (1941:70:5) who said that thousands of eggs are laid on the mud at the bottom of the nest and so long as the larval hatchlings remain in it, they are guarded by the male lungfish. The adults subsist chiefly on molluscs, both snails and bivalves, but are prone to attack other fish when hooked on a long line or entangled in seine nets.

A lively description of African methods of fishing along the western coast of Lake Victoria was furnished by R van Someren under the pseudonym of "Stereo" (1910:1:45). Setting out shortly after daybreak in a canoe manned by native paddlers, he noted that the wavelets, already sparkling in the early morning sunshine, rippled gently shorewards with a droning sound along the white sands of the beach; at this hour there is no hint of the great rollers that will arise later in the day and lash the shore in fury. Silhouetted against the rising sun as they stood waist-deep in water, a long succession of youths and men are engaged in angling for nkeje (ie ngege = *Tilapia esculenta*) which

forms such a welcome addition to their diet of matoke (steamed unripe bananas); from time to time a writhing slivery object appeared on the edge of a line and as he prepared to rebait it and recast it, a pleasant grin spread over the face of the fortunate fisherman. Further down the coast one encountered quaint rafts constructed with the dried ribs of raphia fronds which are obtained from the countless palms which grow in the vast swamps along the shore and inland for as much as four or five miles. In the stern of each raft sat its enterprising owner who, having anchored his frail craft with the aid of a large stone, reaped the advantages of fishing out in deep water.

Eventually, through a break in the almost endless ambatch (mirindi trees) growing in the water a few yards offshore, one caught sight of men engaged in a novel type of fishing. On each of two broad raphia rafts a very long, though light and strong, rope plaited from the fibrous local grasses lay neatly coiled and, presently, one end of each rope was fastened to a series of a dozen or more fish traps that had been already strung together sideways. The basket-work traps are cone-shaped, the large end of each being about four feet in diameter, tapering for six to ten feet towards the opening the internal construction of which makes exit difficult. To mark the location when submerged, a bunch of fronds from the wild date-palm is attached to what will be the top of each trap and banana leaves, fastened to the rope for a distance of from 30 to 50 yards on either side of the baskets, formed a fringe that helped in shepherding the fish towards the traps. When all these preparations were completed, the traps were piled on one or another of the two rafts; each one was in the charge of a man armed with a long pole with which he punted out into the lake. On reaching a suitable spot, where the sandy bottom was free from 10 to 16 feet beneath the surface, the baskets were pushed off one after another as their respective rafts made a wide detour in opposite directions. The men, wearing only a fringe of banana leaves around their loins, then returned towards the shore where two-score willing hands were waiting to grasp the free ends of the ropes which were hauled steadily to bring in the "seine". When this was sufficiently close, some of the men rushed into the water with great splashings to drive the fish towards the ever-narrowing circle of baskets at the centre of which stood another man urging their fish to their doom. When the circle could be contracted no more, each trap was raised and tilted until the captured fish shot out into a basket that was held in readiness to receive them; these baskets were carried to the beach and their glittering silver contents dumped into a shallow hollow scooped in the sand whereupon some of the men sorted the fish whilst others returned to prepare the traps for a fresh attempt.

Further up the beach a youngster had been tending a crackling fire and to it resorted the men in order to toast a few favourite species of fish before there are called upon to haul in another line of traps. In the temporary fishing camps nearby, women were skewering the smaller sprats on sticks so that they may dry whilst the larger fish were split, cleaned and dried. As may be imagined, the odours that assailed one in the vicinity of such camps were anything but fragrant.

Writing seventeen years later, CM Dobbs (1937:29:97) told of the African methods of fishing then current in Kavirondo Gulf at the north-eastern corner of Lake Victoria; at that time the population of Central and South Kavirondo, chiefly Luo, numbered 496,387, all of whom were eager to eat fish when available. The majority of those living near the lake, variously estimated as between 4000 and 6000, spent much of their time fishing, being more or less permanently occupied with it. Rod and line fishing was chiefly indulged in as an amusement by youngsters, their small rods being cut from caire trees; men, on the other hand, were apt to use long rods from the poo tree. Lines were made from papyrus fibre, while a dried piece of mtama stalk served as a float and hooks (cloc), purchased in the bazar, were baited with oniambo worms that live in the mud. With such bait barbels (mumi) were captured but both oniambo or bits of ground nuts would attract osoga (*Alestes nurse*), nyawino, nthira and sire (*Schilbe mystus*) and, at times, long lines (mugondo), carrying many hooks

Kenya Casebook

and buoyed up with floats, were left in the water for a considerable time. Both lungfish or kamongo (*Protopterus aethiopicus*) and the catfish known as mumi (*Clarias mossambicus*) were sometimes harpooned with barbless spears by Africans who waded about in the shallows in search of them; it was said that on moonlit nights the Mohoru people go out in canoes and harpoon fish by the aid of grass torches.

A feature of Kavirondo rivers are the enormous fish weirs (kek), constructed of wood and stone, that stretch across from bank to bank; in the gaps that occur at intervals along this barrier, the people place their musati or musathi, great basketwork traps consisting of an outer and an inner cone formed of reeds arranged longitudinally and laced together. Another type of stationary trap is known as the omungo which, in appearance, resembles a European lobster pot and is baited in the same way. Some of the local Africans use a sienyu, a conical, funnel-like basket-trap constructed of longitudinally arranged reeds like the omungo; however, the broad base is open and there is a smaller aperture at the apex or top. When the owner of a sienyi goes fishing, he wades about in shallow water, periodically planting the open base down on the bottom of the lake or river and a trapped fish betrays its presence by splashing; on hearing the commotion, the operator thrusts his arm through the smaller opening and, groping for the fish, pulls it out.

Women employ a simple cone-shaped basket-trap known as a sunga ketenga, or a more elaborate type in which the outer cone carries a slightly smaller one within it, both facing in the same direction and the women lay three or four of these double-cone traps on the bottom; after retiring to a distance they advance in line towards the traps so as to shepherd into them any fish that they may encounter. The simpler type of trap is used quite differently, being drawn along the bottom in shallow water by hand; one woman grasps the wide open end as she walks backwards and when a fish enters, the open end is promptly raised to the surface so that the basket-trap assumes a vertical position.

Though fishing by such methods had been carried out from time immemorial, wrote Dobbs, it was not until 1905 that it became a recognised industry; this was due to the initiative of a Norwegian named Aarup who, by careful tests, discovered the right kind and best size of net to use. In 1914 the law stepped in and banned nets with a mesh of less than one inch square; occasionally nets of three inch mesh are used to take ningu (*Labeo victorianus*), osoga (*Alestes nurse*) and sira, or sire, (*Schilbe mystus*). Eventually nets with two inch squares, though known to the trade as five inch mesh, were found to be the most satisfactory and with this type of net might be taken a great variety of fish such as kamongo (*Protopterus aethiopicus*), suma (*Mormyrus kannume*), mumi (*Clarias mossambicus*), seu (*Bagrus degeni*), mbiru (*Tilapia variabilis*), ngege (*T. esculenta*) as well as the aforementioned sira.

For one reason or another, locally made nets were not a success and eventually they were ousted by an imported article of three-ply 35 twine, 26 meshes deep and 100 yards long. In Kisumu bazar they sold for 17 or 18 shillings apiece and in 1921, when the industry was flourishing, as many as 20,000 per year were being imported from Ireland. The average life of a net was estimated as twenty days; though, barring such accidents as a crocodile becoming entangled, when operated by a European a net might survive two or three months of constant use. Each net runs on a coir rope above and below, the top being supported by cork floats, the bottom weighed down by its iron rings; fish are captured only when the nets are drifting, so when they catch on obstructions like floating islets they are promptly rendered useless.

At the time that Dobbs wrote there were three Indian fishing village – Seme, Asembo and Nange – in Kavirondo Gulf and Indian initiative soon controlled the industry; they had boats built locally at a

Kenya Casebook

cost of £50 each and these vessels were 35 feet long, 6 feet in the beam and 2 feet deep and carried a lateen sail and ten to twenty nets apiece. The crew, usually five in number, were Africans. They set out for the fishing grounds, of which Kadimu, Karachonya and Asembo Bay were considered to be the best, in the afternoon and at sunset the nets were put down and taken up before daybreak, the boats returning with their catches in the morning. The fish, when plentiful, fetched 25 cents (3 pence) each in Kisumu market and those intended for Nairobi market were cleaned by Kavirondo women who worked beneath a tree on the Lake shore near Kisumu Station. The entrails were retained by the women as their perquisite and the gills – apparently considered to be a delicacy – were retained by the Indian who supervised the undertaking; then the cleaned fish were packed in large chests with plenty of ice – about one pound of the latter (costing 18 cents) per fish. Freight to Nairobi was then 3.50 shillings per 100 pounds weight, so that with other incidentals it cost about 35 cents to despatch one fish to Nairobi.

In 1921, when the industry was at its peak, some 150 boats were at work, thereafter a sharp decline set in; several factors appeared to be involved of which the most important was a reduction in fish in Kavirondo Gulf that made it necessary for the boats to go further and further to secure the ever-diminishing catches and, secondarily, a decline in retail prices, with a consequent reduction in profits, resulted in the wealthier merchants withdrawing from the industry. Deprived of their capital for the purchase of boats and nets, the fishermen had to obtain them on credit or borrow the money at high rates of interest which left the men with so little reward for their efforts that more and more of them abandoned the occupation until in 1927 only a third as many licences were sold as in 1917 or the years immediately following World War I.

Fortunately there is no need to leave the subject on this depressing note for Dobbs' article was but one of several government sponsored surveys as to what should be done to revive the ailing industry in Kavirondo Gulf. Twenty five years later the Journal carried an informative contribution by the Fish Warden, Hugh Copley (1953:94:57) from whom we learnt that the industry, at least in so far as it concerns the two most important fish – ngege (*Tilapia esculenta*) and mbiru (*T. variabilis*) – has made something of a comeback. Engaged in the work "are an estimated 30,000 fishermen, as many as in the whole of the British Isles". Each evening these men lay 272 miles of five inch gill nets; the 8000 nets involved having a value of £17,000 and these flax nets, barring accidents, have a life of six weeks. The captured mbiru are mostly used for local consumption as they do not keep well whereas the ngege, which not only keep well but travel well, are despatched to Nairobi where a steadily increasing population creates a growing demand for this excellent fish. At present, wrote Copley, the market is in equilibrium but he wondered if the breeding stock of ngege was being slowly reduced in order to meet this demand.

In order to simplify the problem, Copley postulates the presence of 13½ million ngege in Kavirondo Gulf and if 4½ million mature fish are being caught each year, will the remaining 9 million be adequate to keep up their numbers? Of course, if the 4½ million removed are replaced by an influx of an equal number from the lake, all is well – apart from the factor of a rapidly multiplying human population with greatly increased spending power. As year succeeds year this is likely to lead to a progressive demand for more and more fish – 6 million per annum and then 8 million per annum and so on. In order to answer this question satisfactorily it is imperative to know whether the stock of ngege in Kavirondo Gulf is actually being reinforced by migration of fish from the reservoir of the lake itself; this matter is complicated owing to the possibility of ngege being subject to natural fluctuations at unspecified intervals; such fluctuations are known to occur every ten to twenty five years in the case of certain marine fish like cod and herring, the activities of which have been studied over a long period.

Kenya Casebook

In the case of ngege a start has been made by Commander G Cole of the Lake Victoria Fishery Service whose staff is engaged in catching, marking and releasing these fish; when subsequently netted it is hoped that their captors will report these marked fish and so contribute to the building up of a body of knowledge that will shed light on the movements of ngege shoals. A vital factor in the maintenance of these shoals is the survival of the hatchlings after their yolk sacs have been absorbed and they commence feeding on microscopic plankton; if adequate supplies of phytoplankton are not present in the water each year just when millions of tiny tilapia require it, the fish simply perish and there will be a decline in the catch for several years afterwards.

Departing from Kavirondo Gulf, Copley informed us that from the lake as a whole 80,000 tons of fish are removed each year and he reminded us that Victoria Nyanza's greatest breadth is 200 miles, its length 250 miles and its shore line 3000 statute miles; that is to say that this central African lake has an area of 26,000 square miles, being almost as large as Scotland.

The Fisheries Service, responsible for seeing that the industry is conducted in accordance with the regulations, has a fleet of three ships and is administered by Commander Cole and six officials. In 1953 the cost of running the service was £20,128, a sum met by equal contributions from Uganda, Kenya Colony and Tanganyika Territory – the three countries which border the lake.

Chapter 14

FISH THAT LIVE IN SODAWATER AND IMMIGRANT FISH

About the last liquid in which one might expect to encounter living fish is that of Lake Magadi which lies in a depression of the Rift Valley and which is surrounded on every side by arid country; the nearest fresh water being that of the Southern Uaso Nyiro at least fifteen miles to the west. It is from beneath the cliffs on the east that the springs arise which feed the lake; from two to three inches in depth and highly charged with soda, the water flows over silica before reaching the lake and, in addition to the heavy impregnation of sodium carbonate, there are traces of sodium bicarbonate, sodium chloride and magnesium carbonate. All of this information was furnished by CW Woodhouse (1912:4:95) who added that at 9.30 in the morning the temperature in the shade was 92°F.

These were the conditions under which the fish were living when found by Woodhouse who preserved and despatched some of them to Dr GA Boulenger at the British Museum who, in response, told Woodhouse that they were immature examples of a cichlid known as *Tilapia mossambica*. Returning to Magadi in December 1911, Woodhouse collected ova, fry in all stages of development and breeding adults. Males, readily recognisable when mature by their iridescent and brighter colouring, displayed more white about the lower jaw, lacked the vertical barring characteristic of females, and usually were larger. Conversely the duller females were, though considerably swollen when gravid, of smaller size and appeared to be much less numerous than the males.

The male, having selected a suitable slot, frequently one near a large stone, proceeds to clear an area some three inches in diameter; not only does he diligently remove the green algae that coats the bottom of these soda springs, but he assiduously removes all small stones which is accomplished by taking them up in his mouth, one by one, and depositing them around the periphery of the selected area, thereby creating a slight depression in the sandy mud. As soon as this simple nest is ready for the reception of the ova, spawning by one or two females takes place whereupon the male, his belly pressed against the bed of the nest swims slowly forward depositing milt. Afterwards other fish "appear" to make their contributions to ova or milt but trespassing fish are at first chased from the vicinity by one or other of the males; however, guard duties seem to be discharged in a somewhat perfunctory fashion and the protective instinct of the males wanes long before the ova hatch. Soon the eggs are concealed beneath the spreading growth of green algae which is such a feature of these soda springs.

No sooner does hatching start, however, than a great revival of interest takes place among the relations who rush to the spot and speedily devour as many alevins and ova as can be found and it was from the stomachs of these voracious cannibals that Woodhouse secured the majority of the alevins which he preserved. Others, by hiding in the algae manage to escape the attentions of their relatives and, after absorption of the yolk sacs the tiny fish seek out the shallowest water that they can find, usually from a half to one inch in depth. Once the fry stage is past, the growing fish move into the cover afforded by the grass and reeds growing in the springs and there they remain until

large enough to venture into open water and merge with the shoals of fish about their own age.

Apart from consuming their own ova and fry, these cichlids seem to subsist on water-fleas (Cyclops) and vegetable matter; food would appear to be in short supply owing to the large number of fish present in each spring. Scarcity of food combined with their restricted habitat are probably sufficient to account for the stunted growth of Magadi fish of which the very largest are only 3½ inches in length, however one of such dimensions is quite exceptional. Their adaptation to life in waters so strongly impregnated with soda at such a high temperature is quite remarkable and one wonders how and when fish first reached the springs. Are they survivors from some remote period when the waters of Lake Magadi were less solid soda than is the case today? The physical features of the surrounding country exclude the possibility of their having been water-borne to their present isolated environment. Woodhouse, himself, favours the theory that the progenitors of these fish may have arrived as ova adhering to the feet or bills of the flamingos, pelicans or duck which frequent the lake. But is Woodhouse correct? Probably not now that we have the geological evidence presented by TH White in "Some Speculations on the sudden Occurrence of Floods in the History of Lake Magadi", an article (1953:94:69) that includes photographic reproductions of semi-fossil impressions of fish, identified by Hugh Copley as *Tilapia nilotica*, but considerably larger than those inhabiting the alkaline springs today. Such impressions are numerous in the upper light and dark layers, roughly estimated at 155 pairs, of silt which forms the "High Magadi Beds"; actually these are the lowest beds and extend at most for six miles in a north-south direction from the soda lake – the highest beds reach to Nguruman Escarpment about twenty miles west of Magadi.

There is evidence of considerable flooding during a late Pleistocene pluvial period and, also, about 500 years ago; evidence of considerable flooding can be found at heights of as much as 300 feet above the present level of the soda. Dr White suggests that intermittent floods brought freshwater fish in contact with the then existing siliceous springs, causing immense numbers of them to perish; they are the source of the sub-fossil impressions to be found in and just above the silica. Later a massive flood occurred, bringing with it from the countryside "the soft unconsolidated lacustrine deposits of an earlier period", the fish remains of which were fragmented in the process. The immense quantity of silt laid down may have effectively smothered the silicate and soda and this would have permitted by the formation of a lake of relatively fresh water in the annual silt deposits in which were preserved the fish that died during successive dry seasons. Each succeeding generation of survivors was better equipped to adapt itself to a progressively alkaline and shrinking habitat. It is their dwarfed descendants which occupy the soda springs of Magadi today. Technically, of course, these are freshwater fish and so receive a brief mention by Copley (1941:70:1) in his useful survey of the freshwater fishes of Kenya; this article lists the principal occupants of every major lake and river in the country and is accompanied by more than two dozen sketches of the principal types.

Like Lake Magadi, though the sodium carbonate content (pH 9.4 – 9.6) of waters is not nearly so concentrated, Lake Rudolf, situated on the northern frontier of Kenya with Ethiopia and Sudan, provides a home for *Tilapia nilotica* which there attain a weight of twelve pounds. But Lake Rudolf, though only 15 to 35 miles in breadth, is 180 miles long, and consequently supports a rich and varied piscatorial population of about forty different species. Their affinities with the fish fauna of the Nile system is pronounced, though there is no longer any connection or communication between them. Lying in a trough of the Great Rift Valley at an altitude of only 1250 feet, the waters of the 300 feet deep lake have an average temperature of about 86°F; to the west the country is practically desert and the eastern shoreline is steep and rocky while from the waters of the lake rise three small volcanic islands.

Kenya Casebook

Some 15,000 years ago towards the end of the pluvial periods snow lay on the summits of the Aberdare Mountains and extended 1,000 feet further down the slopes of Mount Kenya than it does today; at that time the level of Lake Rudolf was 475 feet higher than it is now and much of West Suk and Turkana were submerged. Rainfall was then so heavy that the water flowing into Lake Rudolf exceeded that which was being lost by evaporation and the surplus escaped northwards towards the Nile in what is now the dry bed of the Sobat River. With the ending of the pluvial period the waters began shrinking until contact with the Nile was lost and Lake Rudolf became isolated; subsequently due to progressive dessication and constant evaporation the lake water lost its freshness and is now scarcely fit for drinking. Not only did the Lake Rudolf fish fauna survive the change but, over the centuries, many of the species developed definite, though slight, differences from their ancestors in the Nile.

To Kenya anglers Lake Rudolf has long been noteworthy as the only place in the colony inhabited by the Nile perch (*Lates niloticus*), locally known as baggera. In the early days of the Journal it carried a paragraph by Blayney Percival (1918:13:347) stating that an officer of the King's African Rifles, using only a light rod and tackle, took many perch weighing from 15 to 30 pounds and, after a two-hour contest, one that turned the scales to nearly 47 pounds; a photograph of this monster, almost as big as the soldier holding it, accompanied Percival's note. FG Aflalo, who visited Uganda just before World War I, told (1914:8:124) of trolling with a spoon for Nile perch at Butiaba on Lake Albert; in the course of two days he landed punda, as this perch is called locally, of 30¼ and 40 pounds weight. These weights are not exceptional, of course, for Copley told us that though the males rarely exceed 30 pounds in weight the females attain as much as 300 pounds. Somewhat surprising is the statement that two races of Nile perch inhabit Lake Rudolf, the bigger of the two (*L. n. rudolfianus*) living in the bays and inshore waters while the smaller of the two *L. n. longispinis*) inhabits the deep open lake. The flesh is palatable and wholesome and is sought after by local tribesmen; however, owing to the relative inaccessibility of Lake Rudolf the economic development of its fisheries is unlikely for some time to come.

There are other denizens of Lake Rudolf that are less welcome to anglers. One such is the electric-fish (*Malopterurus electricus*) which can deliver a substantial shock to the unwary hand that attempts to disengage a hook; the barbels of the electric-fish might cause it to be mistaken for a catfish (*Clarias*) but the fins are edged with orange-red and its blue-grey skin is irregularly blotched with black. Then there is the puffer-fish (*Testrodon fahaka*), so-named because of its ability to inflate itself like a balloon; in this condition the fish is helpless but, one may suppose that this would also apply to a would-be predator that had hoped to swallow it. Inflation brings into prominence the countless minute spines that stud the skin and make it feel like sandpaper. The olive grey of its upper surface is longitudinally streaked with black on the hinder part and flanks and the belly is yellowish. Fusion of the teeth gives the appearance of a beak like that of the marine parrot-fish.

Apparently the native fish fauna did not satisfy the immigrant anglers for long and those who settled in the East African highlands seemingly were irked to find some streams, suitable for brook trout, without any piscatorial inhabitants. So, being sportsmen first and naturalists second, they lost no time in founding the Trout Acclimatisation Association and the business of introducing foreign fish began. This, we are informed by DE Hutchins (1912:4:80), was in 1905 when SL Hinde, the Provisional Commissioner, supported by the Association, introduced trout to the Gura, a small stream on the cold moorland crossed by the Naivasha to Nyeri road. Three kinds were involved – the California rainbow, Loch Leven and German brown trout; most of the fry from the last consignment died before being liberated but it was thought that a few escaped into the stream and

Kenya Casebook

three years later, ie in 1908, Hutchins and W McGregor Ross, en route for Mount Kenya, halted beside the Gura River for some time but could see no fish. On 28 August of the following year Sir FJ Jackson camped in the Aberdare Mountains and the very first number of the Journal (1910:1:56) carries an account of his experiences; downstream from the hatchery and 150 yards below the footbridge which crossed the Gura, he succeeded in landing five brown trout with a small grouse-wing fly. These fish, probably all hatched from the same consignment of ova, ranged from 6 7/8 to 8 inches in length and were slightly over a quarter of a pound in weight.

At Jackson's suggestion the Forestry Officer, Guy Baker, tried to see if he could get any larger examples and, within three miles of the hatchery, Baker, using fly as bait, secured a brown trout of 5¼ inches and a large one measuring 9 inches; the latter was more silvery than the others and had a relatively rounder and shorter head, causing Jackson to suggest that it might be a rainbow trout. Baker also submitted a photograph of a 15 inch fish weighing 15¾ ounces which Jackson hailed as probable proof that the imported trout had begun to breed - when Jackson wrote he obviously did not know that Baker had observed trout spawning in the Gura the previous September. Crabs had been seen eating some of the ova and now the tables were turned and trout were eating the crabs.¹ Baker reported that the upper reaches of the Gura were well stocked with trout weighing a pound or more; of these the larger were preying on the smaller, so a number of fish were hooked – usually with a worm bait – and, with few casualties, were placed in canvas buckets for distribution to other rivers on the Aberdare Range. Discovering that inadequate aeration of the water in the buckets was causing exhaustion among the fish, they were transferred to small reservoirs while awaiting transport and in the course of three days the two largest trout, each weighing 3 pounds, ate thirteen out of a total of 27 smaller ones sharing their dam. A 9-inch fish was drawn from the gullet of one of these cannibals as it was being transferred.

All told, Baker transferred 29 trout to the Morendat and 35 to the Chania River; most of these fish appeared to be ordinary brown trout but some, though possessing the red spots of brown trout, were very light in colour apart from the numerous black spots along their backs. One trout, though densely spotted with black, lacked the red markings, while its fins – particularly the one just over its tail, were somewhat larger than those of brown trout. During the Gura operation Baker saw no rainbow trout (*Salmo irideus*) and thought that if any were left they must have moved downstream below the bamboo, which was as far as he had fished. Be that as it may, rainbow trout survived and flourished, for forty years later their diet in the Keringa, Thiba and Sagana Rivers of the Kerugoya and Nyeri Districts of Mount Kenya was intensively studied by Dr Vernon D van Someren (1945:83/84:148). Such scientific studies possess a special importance where non-indigenous fish are concerned for such introductions may have unforeseen consequences in their effect on the local fauna; by way of illustration van Someren cites the view, held in some quarters, that the aquatic life of certain inland waters of New Zealand has been so depleted by the introduction of alien trout that the latter are now in danger of starvation. Owing to lack of competition, and presumably one might add of suitable enemies, the fish multiplied to a point where the available food was inadequate to support them; such a situation is unlikely to occur in Kenya owing to the breeding range being restricted to temperatures below 58°F.

Despite the importance of van Someren's article, his study is too detailed to be of general interest; several trout had swallowed twigs, one of these twigs was 1¾ inches in length and one eighth of an inch in diameter and another fish had snapped up four breast feathers of a francolin and a pigeon. Generally speaking the type and variety of food taken did not differ from that which rainbow trout

¹ A detailed study of the diet of brown trout in the Gura has been published elsewhere (Copley, 1940, East African Agricultural Journal, March)

Kenya Casebook

would seek out in European waters. While brightly coloured lures of large size are unquestionably successful, van Someren's findings suggest that small "pattern" flies of the dun and spider type should be equally so, as they resemble the bulk of the underwater food taken by the rainbow trout of Kenya.

Stephan Deathe, Fishery Officer at Kisumu, reported (1946:85/86:68) the capture of two female rainbow trout between that town and Kendu (approximately 0° 15' S and 34° 45' E); they were taken in October 1937 and October 1945 by Luo fishermen using five inch flax gill nets anchored in twelve feet of water. Both fish were fully ripe and ready to spawn and, had they done so, the high temperature of the water would have prevented the establishment of rainbow trout in Lake Victoria, commented Vernon D van Someren who examined one of the fish at the Coryndon Museum where it is preserved. One fish was 15 inches in length and the other, which weighed 2¼ pounds, measured 17½ inches but lost 4 inches by shrinkage in the preservative. Unless these trout had been released in the lake by some enthusiast, Deathe suggested that they may have come from a Mount Elgon tributary of the River Sio which discharges into the northeast corner of the lake about 90 nautical miles from where the fish were netted. Less likely alternatives were also discussed.

When, by the introduction of blankets and other amenities, European initiative had succeeded in combatting the inclement or rigorous climatic conditions that had deterred Africans from settling at high altitudes, the restless immigrants turned their attention to other matters, including fish. With the development of farming in the highlands of Kenya an ever increasing number of rain-filled reservoirs were constructed at heights of 7,000 feet or more. The water behind these dams, wrote Copley (1953:93:35), was far too cold for African tilapia and, while European trout may thrive in them for a time, being without access to gravel spawning grounds the females succumb spawn-bound. As char are known to spawn on the muddy sides of Swedish lakes, it was thought that some species of char might live and propagate in such reservoirs. The colouring of a char serves to distinguish it from trout like the brown or rainbow; the dark green back of the char is marbled with short black lines, the somewhat lighter green sides merge into the white belly that may have a yellowish or pink flush – bright crimson in males as the breeding season approaches. The dorsal fin bears black rings or markings; the upper and lower caudals are barred and the forward edges of the ventral and anal fins display a white line with a black base that is visible when the char is swimming. For the experiment neither Alpine char (*Salvelinus alpinus*) nor Windemere char (*Salvelinus willoughbii*) was selected, instead the American brook trout (*Salvelinus fontinalis*) was chosen for naturalisation.

In January 1949 2000 eyed ova were received from the Freshwater Research Station at Windemere; they were placed in a Kashmire box and, by March, 1750 fingerlings were being cared for by Mr Martindale, the Hatchery Superintendent. Unlike fingerlings of the brown or rainbow trout, these youngsters refused to take boiled egg-yolk or fish, accepting only liver and a minor disaster occurred in April when the river brought down silt which choked 648 of the fingerlings. As compared with brown or rainbow trout these American char proved delicate and more difficult to raise. Fifty one of the fish were placed in dammed reservoirs on the farms but the chief objective was to introduce them to Lake Höhnel at 14,000 feet on Mount Kenya; if they survived and multiplied, their offspring could be used to stock the rest of the high-altitude tarns and rivers on the mountain in preparation for the day when the area would be proclaimed a National Park. So, on 1st September 1949 five mules, each carrying a pair of debes (four-gallon cans) holding ten three-inch American char, set off up the mountain and, on reaching the upper limit of the bamboo at 14.30 hours, Mr Martindale, who was superintending the operation, had the debes offloaded and placed in a mountain stream the temperature of which was 51°F. When the temperature of the water in the

Kenya Casebook

debases had been equalised, the char were transferred to holding baskets and left in the stream overnight; next morning the fish were returned to the debases and the journey resumed – Lake Höhnel being reached at 17.30 hours on 2nd September.

Ninety nine of the one hundred char with which Martindale had set out were successfully released in the lake the waters of which were at a temperature of 51°F and the following morning two fish were observed feeding in the shallows of the lake which was then closed to all fishing. Three years later, ie on 27 September 1952, Martindale returned to Lake Höhnel to see how the char were faring; he saw about five large fish rise, but caught none – a female weighing approximately 2½ pounds was found dead, apparently as a result of being spawn-bound. Back at the Research Station where one hundred char had been retained, they were thriving and growing just as well as the rainbow trout; as both brown and rainbow trout do not ripen in East Africa until their second year (until their third or fourth in Britain and in the USA), it was somewhat of a surprise to find two females gravid on 13 July 1950. These and five others were stripped, yielding good ova in small quantities; male milt was scanty but in December 242 fry resulted. The following year two fish yielded a little ova but the majority were spawn-bound and few fingerlings resulted; this duplicated the experiences of German hatcheries where char produced relatively abundant spawn during their first year but very little in the second year. This importation of American brook trout into Kenya had proved to be a failure due to some defect in the environment; Dr VD van Someren attributed this to the fish having too few hours of daylight, coupled with too high a water temperature and the absence of the winter period.

During 1908, in the course of a tour round Lake Naivasha, Sir FJ Jackson the Lieutenant General learned that in this great expanse of water there were no fish of large size; as a result a small sum of money was raised by public subscription and DE Hutchins (1912:4:84), who had cultivated carp in South Africa, undertook to import some which the Manager of the Union-Castle Company at Cape Town agreed to transport without charge. With the speed characteristic of the times, several years slipped by without anything further being done in the matter. Then, early in October 1911, there arrived at Kilindini a carboy containing 45 small carp, each about half an inch in length; however, on the way up from Kilindini the carboy rolled off the waggon and was smashed! But carp are hardy fish and prompt action by the Transport Department averted a tragedy; forty two of the fish were salvaged and placed in fresh water, so they arrived safely at Nairobi on 9 October. Hutchins being away at the time, the carp were released in a reservoir that already supported a population of local fish of carnivorous habits. When Hutchins returned he had the reservoir pumped out and the native fish separated from the thirty three surviving immigrants; we were not told what befell the local fish but about mid-December the carp were returned to the reservoir where they thrived. For reasons unknown two of them succumbed and came floating to the surface, providing evidence that they had grown five inches in four months; they appeared to be perfectly healthy but, after Dr Ross had examined them, he pronounced death as due to intestinal inflammation for which a possible reason was the dirty state of the water resulting from the recent cutting of a tributary furrow from the Nairobi River.

Though carp will live in dirty stagnant water for months, in Hutchins' opinion they do not grow so well; moreover, should the water remain unchanged for too long the fish are liable to be attacked by a disease that the French call peste rouge. At Nairobi little was to be seen of the introduced fish during the daytime but towards evening, when gnats and mosquitoes began flying over the water, the carp would rise with a rush to seize their evening meal with a smack-of-the-lip sound that is characteristic of the species. The immigrants required little or no artificial feeding and, despite the abundant vegetation providing suitable shelter for mosquitoes around his house, Hutchins averred

Kenya Casebook

that mosquitoes were less plentiful than at most Nairobi homes, clearly inferring that the presence of the carp was responsible for this welcome state of affairs. Indeed, he claimed that one of the principal advantages resulting from the introduction of carp is their assistance in controlling mosquitoes by eating their larvae; Hutchins went on to quote Sir Herbert Maxwell as saying that carp are really omnivorous for, in addition to worms and small fish, they browse freely on water-weeds and grass.

When the carp multiplied sufficiently, Hutchins proposed introducing them to other reservoirs and ponds, then Lake Naivasha and possibly also to the brackish waters of Lake Nakuru and of Lake Elementeita.

Chapter 15

SOME SALTWATER FISH AND THEIR FOES

As recently as 1942 Hugh Copley (1942:71/72:136) told us that if a one-eyed man meets an African whilst he is setting out for a day's fishing, the encounter is considered to be so unlucky that the would-be fisherman would turn back rather than put to sea. Similarly a professional will not pick up a fish by its tail as nothing but misfortune would arise. When erecting an uzio (fish trap), the owner places a small offering of food in the hope of influencing the appropriate spirits to guide many fish into his trap. Though nothing of this nature was mentioned by RJ Cuninghame (1912:5:4), it helps one to realise something of the obstacles that he encountered when he started out to make a representative collection of the marine fish at Mombasa for the British Museum. Quite unavailing were the friendly efforts of government officials and other residents on the island who sought the cooperation of the local fishermen by explaining the purpose of Cuninghame's visit. Not unnaturally the mixed Afro-Arabian population feared that Cuninghame's activities were but a prelude to the inauguration of commercial fishing by Europeans and that this would endanger their own means of livelihood. At first their opposition was so well organised that Cuninghame found it impossible to obtain a boat or any assistance whatever.

Cuninghame waited. Day after day he went down to the Fish Market, paid well for specimens and asked endless questions about them, took measurements and carefully fastened number-bearing leather tags to the fish before placing them in a tank of preservative solution that he had brought for the purpose. Gradually the fishermen came to know him and concluded that he was peacefully inclined, even though a trifle mad. At the end of ten days four men were prepared to hire themselves and their dug-out to him. For those who entertain illusions about the fun of fishing from such a craft in tropical seas, Cuninghame offers disillusionment; not only is the heat overpowering but, after eight hours or so of exposure to the sun, the continuous glare of the shimmering water is apt to induce a violent headache. Some measure of relief was afforded by dark glasses which Cuninghame considered to be essential under such circumstances.

These Mombasa men proved most skilful and ingenious in their devices for capturing fish. Beside their uzio traps, similar to those used by other African fishing communities, they have huge creel-like lobster-pots; these creels, constructed of strips of coconut-palm leaves, are about two feet high, four feet broad and seven feet long. After being baited with seaweed, gathered on the reef at low tide, they are lowered into four or five fathoms of water either within or without the reef. Periodically they are visited by the two men in a dug-out; on reaching the spot one man dives to the bottom to inspect the trap. If it is found to contain fish the creel is hauled to the surface where it is dexterously balanced athwart the dug-out with a skill that evoked Cuninghame's admiration. A pointed stick is used to prod the fish out of the trap, after which the trap is rebaited and returned to the bottom, usually accompanied by one of the men in order to settle it in a good position. The creels are remarkably durable but should be thoroughly dried twice a month. When tidal conditions were favourable Cuninghame would patrol the coast, inspecting as many as ten catches in the course of a few hours; in this way he secured many of his best specimens from the scores of traps set along the ocean-front or in the lagoons around Mombasa Island.

From the same materials used in the construction of the creels the fishermen manufactured dragnets which are thrown into about five feet of water from a boat as it is paddled in a great semi-circle – net and rope together being about eighty yards in length. Hauling in such a net took the united efforts of a dozen men; during this process three of them went to the furthest end and, remaining under water as long as possible, sought to keep the net clear of the ragged coral boulders. Though the quantity of fish captured in these dragnets amply compensated the operators for their effort, Cuninghame found the variety of species too small to justify his continuing this type of fishing; after half a dozen attempts he abandoned dragnet collecting.

Naturally other methods were also tried – trammel net, trolling and hand lines. The best places for using the latter were in water of from fifty to eighty fathoms depth, so that pulling in a capture was distinctly arduous. Trammelling certainly proved to be a failure for the bottom was too rocky and the tidal currents were always too strong. The period of the north-east monsoon is from December to March and March and April were the months in which Cuninghame did his collecting; from April to October the south-west monsoon prevails, bringing with it the heavy rains. During both monsoons migrations of fish take place and Cuninghame (incorrectly) estimated that he had captured 112 species of fish during the period of the north-east monsoon, while after the breaking of the south-west monsoon he thought that he took 68 different kinds that “undoubtedly arrived from the south”. A further 22 species were believed to be year-round residents at Mombasa. During a period of collecting that was slightly in excess of two months, the number of different kinds of fish secured by Cuninghame and identified by Tate Regan at the British Museum, proved to be only 141¹. The list, together with English, and Swahili names where known, appeared in the Journal the following year (1913:7:47-52) and served as a foundation for later research.

Of the resident fish that were fairly numerous around Mombasa Island, the largest was the bonito (*Acanthoscybium solandri*)², locally known as unguo; Cuninghame showed a photograph of one that was only was 4 feet 10 inches in length and weighed 45 pounds but stated that the species attains 80 pounds. He saw big bonito leaping ten feet from the water just opposite Kilindini Pier at high tide; it is in pursuit of smaller fish that these bonito come up the channel where they remain for a couple of hours until the turn of the tide. At other times they might be seen springing from the sea four miles out from land. On one of his trips Cuninghame was accompanied by a friend armed with a tarpon rod, reel and line and, when well outside, they began trolling with a small, two inch, pike bait known as a “clipper-spinner”. This was seized when they were about three miles from shore at the 100 fathom line; at the outset the rushes of the fish, which never showed itself, were really serious. Even towards the end of the contest when the fish were brought alongside its vitality was such that it bent the new and strong steel gaff. Cuninghame believed that any silver spinning bait carrying a red tassel will attract these fish; even a scrap of white cloth, on which a piece of red material has been sewn, may prove effective provided that the boat is moving at a speed of not less than 8 mph or thereabouts. Silvery fish or squid are among the natural bait that an unguo will take. Another sporting fish is the faloosi or dolphin-fish (*Coryphaena hippurus*) – not to be confused with the marine mammal called a dolphin – which is one of the migrants that arrive at Mombasa from the north about December, the last of them moving on down the coast towards Mauritius by the end of March. They travel in shoals of fifty or more and, being surface feeders, a great many are caught by Swahili fishermen who troll for them with a single hook baited with a scrap of squid. When a faloosi is hooked, its captors haul it within a boat’s length, then throw out three more lines bearing

¹ “200 or more” is presumably an overestimate, possibly due to Cuninghame failing to make due allowance for age and sex variations.

² Cuninghame misnamed it as a barracuda (1912, page 8), but for unguo see the Journal (1913 page 51).

baited hooks which they have been holding in readiness for such a moment; this technique usually results in the capture of half a dozen members of the shoal before it departs. If trolled for, Cuninghame advocates the use of a light, say 13 ounce, rod and line. A “clipper-spinner” or spoon bait should be used but the mouth of a faloosi being relatively small and the surface of the palate bony, a single long-shanked hook should be employed in preference to a triangular one which is of little use.

A later contributor, CW Woodhouse (1918:13:343) devoted an entire article on faloosi fishing at Mombasa. He described the dolphin¹ leaping free and at large as having a silvery body that displays a golden sheen in certain lights, while the flanks are spotted with blue and the belly is a rich orange. When caught, dolphin-fish have long been notorious for their changing colours – gold, green, greenish-blue and silver – that play over the body of a dying fish; it is grey when dead. Woodhouse’s article differs from that of Cuninghame, of which no mention is made, in many minor points. For example Woodhouse states that the first faloosi arrive from the north in January; these fish are not in shoals but consist of two or three individuals, or possibly a lone one; they are always larger than later arrivals and weigh from 20 to 30 pounds. The large shoals, containing 10- to 20-pound fish, do not appear off Mombasa until March or April (the months in which Cuninghame collected) and leave in June though a few must remain for they are to be caught all year round. According to the Mombasa fishermen and Woodhouse’s own observations, the swift-swimming faloosi is entirely a deep-water fish that never invades shallows; occasionally a faloosi will come within a mile of the outer reef or it may be necessary to venture as much as ten miles offshore before any are encountered. This, naturally, is a somewhat risky undertaking as a strong breeze may spring up and make it difficult to regain the harbour. In a bad sea, stated Woodhouse, a native canoe is preferable to the usual shore- or motor-boat; if the latter is used, it is wise to take oars or other auxiliary propellants in case the engine should break down when out at sea, a catastrophe that might have serious consequences.

Woodhouse, like Cuninghame, advocates the use of squid as bait, but goes further by furnishing directions as to how one of these secretive invertebrates can be secured. Even when hungry, an ngisi – as a squid is called in Swahili – must be approached with circumspection; its habit is to rest concealed amongst the seaweed covering the bottom of the lagoon within the outer reef. In the early morning your canoe should be paddled over the inner reef and allowed to drift slowly through the still water where it is one fathom or less in depth. A dead fish, about 5 inches in length is secured by the tail to a slightly weighted line, is allowed to sink towards the bottom before being slowly withdrawn. If this bait passes a concealed and camouflaged squid, the latter is likely to seize it with astonishing swiftness; such rapid action is almost certainly aided by the lateral fins or “wings” with which a squid is provided. To coax a squid, the average length of which is some two feet, and its prey within five or six yards of the canoe calls for considerable caution. When at last accomplished a stout line bearing a leaded triangular hook is cast just beyond the squid and withdrawn with a quick jerk that impales the squid; after discharging its sepia, the wildly splashing squid is hauled on board and promptly killed. The mottled umber shade that served the squid so admirably during life, changes to pearly white when it dies.

For faloosi the most attractive part appears to be the squid’s internal organs which are carefully bound by palm-leaf fibre to the top of the hook whereupon the hook is passed several times through the squid’s severed head and lashed so as to leave the trailing tentacles free to wave when drawn through the water; lastly the two long arms are detached from the body and through their ends the

¹ Which he names as *Coryphaena haletus*.

hook is passed once so that they too will waggle behind the hook. When a supply of squid sufficient for a morning's fishing have been caught, a suitable gap in the outer reef is sought through which the canoe can pass to the ocean. Negotiating such passages calls for experience and skill, so it is well to ascertain in advance whether your boatman really knows the opening and is not cheerfully taking a chance; a slight error in judgement may result in an unpleasant accident for many passages are devious, making it necessary at times to turn the canoe broadside to the oncoming waves.

Early in the year when the big fish come south, the sportsman is likely to have a strenuous, if enjoyable, morning; once the breakers are cleared on a fair day, the canoe can be sailed, if not rowed, out to sea if the water is reasonably smooth. Woodhouse, not wishing to risk a valuable rod and reel should the boat capsize, used some seventy yards of handline which was paid out astern. After heading ocean-wards for three or four miles a violent snatch on the line was the first intimation that a dolphin-fish had been hooked. Next moment a gleaming faloosi leapt a good six feet above the surface of the water. From then on any fisherman will find his work cut out to handle the equivalent of a crazy torpedo, while keeping the canoe in a seaway. In the absence of a gaff¹ a wearied faloosi, even though large, may usually be hauled aboard by taking advantage of the rolling waves. To accomplish this without simultaneously shipping too much of the Indian Ocean calls for some dexterity.

Another enthusiast, EK Boileau, contributed a well-illustrated article on "The Game Fish of Mombasa and Malindi" (1916:10:65-71) and (1917:11:240-244). After paying tribute to Cuninghame as the first to invite attention to the possibilities of big-game fishing along the coast, he remarked that November to March are the best months for sport in Mombasa, with little opportunity once the south-west monsoon has started. This is not the case in Malindi Bay which remains relatively calm, being sheltered from the fury of the wind, so it becomes the haven for many small fry which are sought after by the game fishes. With the possible exception of the djodari or bonito (*Thynnus pelamys*) of which, at that time, only an eleven-pounder had been taken with rod and line, Boileau regarded the msio or barracuda (*Sphyraena* sp.) as "the finest fighting fish on the coast". When hooked, it can generally be recognised by its clean rushes on the surface; it rarely sounds and "is full of grit to the finish"; one landed by Boileau weighed 57 pounds and was just over five feet six inches in length. A photograph of this huge fish illustrates the article.

Next to barracuda in importance from an angler's viewpoint, Boileau ranks the nguru mtwana or kingfish (*Acanthocybium solandri*)². All the year round it can apparently be found somewhere or other along the coast, though something of a local migrant; at Malindi, for example, kingfish may be abundant off Casuarina Point one day and the next near Mambrui at the opposite extremity of the extensive bay. Local fishermen, using large sardines (called dagaa at Malindi, seemu at Mombasa) as bait, troll for nguru mtwana while sailing at a speed of from four to six knots; at a slower rate the fish are apt to be missed. Many other species of importance to anglers are discussed by Boileau but, for mention here, I will select only the sulsuli or sailfish (*Istiophorus* sp.)³ of which none had been encountered by Boileau, but in the course of a year about four or five appear in Malindi market and it is the photograph of one of these that illustrates his account. Boileau's attention to the presence of this great fish was due to Dr Maula Bukhsh, the local medico, who showed him a dorsal fin measuring some two feet in length and about three feet in height. According to native reports this fin is erected by the sulsuli when swimming on the surface in calm weather. A deep groove,

¹ A weapon characterised as useless by Cuninghame.

² A scientific name which Cuninghame attributes to the unguo or bonito (1913:7:51).

³ Loosely called "swordfish" by Boileau whose illustration is correctly captioned *Istiophorus* sp., though listed as "*Histiophorus*" on page 242 of his second article.

Kenya Casebook

extending along the lower surface as far back as the vent, is for the reception of a pair of bony, styliform, ventral fins, the length of which would otherwise prevent the fish from resting on the bottom. It is the Arabs who call the fish *sulsuli*, the Swahili name is more picturesque, namely *frasi ya bahari*, ie seahorses. So fierce are large sailfish when hooked that – in order to avoid their attacks on the boat – Malindi men are frequently forced to cut away the line.

Though both sailfish and marlin (*Marlina* spp.) have long been known to occur off the Kenya coast, the presence of swordfish (*Xiphias gladius*) in this part of the Indian Ocean was unknown, stated Copley (1943:75/76:274) until some natives found the trunk of a palm tree washed up on the shore near a house; when the boys told the owner, Mr Carberry, that a sword was thrust through the tree, he had the sword-bearing section of the trunk sawn off and sent to the Coryndon Museum. At the point of penetration the palm was two feet in diameter, yet the sword had gone clean through it and protruded on the far side; this gives some idea of the terrific force with which the floating log must have been attacked by the fish. Before the latter was freed, presumably to perish, by the snapping of the 26 inch sword, an epic struggle must have taken place; suggested Copley, whose note is accompanied by sketches.

There is one fish that periodically causes a sensation among Moslems, wrote Copley (1934:12:51). Young examples of this species, up to seven inches in length, are a rich chocolate or blackish brown colour with a series of well-spaced, but somewhat narrow, vertical white lines on either side; the pectoral fins are brownish, the front edge of the ventral fin is edged with blue and bears several narrow blue lines as do the soft vertical fins. The caudal fin is also ornamented with white lines that are a continuation of those present on the flanks, but variously broken into irregular lines and dots. When these markings resemble the Arabic characters for *sham-a-la*, the work of God, or *sham allah*, the miracle of God, the discovery causes much excitement among the fishermen. Such a fish is likely to be carefully preserved and possibly deposited in the local mosque for the edification of the faithful. One of these sacred angel-fish (*Holacanthus semicirculatus*) or *gangu* as they call them, when taken at Port Sudan was sent to Medina, recalled Copley; there is another in Cairo and a third in Zanzibar. The species is common and the one netted in Mombasa, of which a photographic reproduction illustrates the article, is now on exhibition in the Coryndon Memorial Museum at Nairobi. As may have been deduced, this handsome ovoid fish has an extensive range, not only from Aden to Mozambique, but on through the East Indian archipelago to Melanesia and Polynesia. Not all this information stems from the article quoted above, some is derived from a later account, also by Copley (1944:79/80:299) regarding the fishes to be found on coral reefs. The descriptions are accompanied by sketches of thirty three of these bizarre or beautiful creatures the striking markings of which are usually distinctive.

Apart from the marine fish, and more recent descriptive cataloguing of the rich cowrie fauna, there is almost no mention in the Journal of the wonderfully rich seashore life of the East Coast. One puzzling phenomenon is indeed raised by the entomologist, Dr GD Hale Carpenter (1919:14:494), but the explanation that he advanced is incorrect and the right one was never published. How many of us, when walking along exposed stretches of the shore at low tide, have occasionally heard a sudden snapping noise of a cork being withdrawn from a bottle, or a loud smack of the lips? Carpenter said that at various points between Mombasa and Durban he had heard the sound seemingly emanating from the ground in close proximity to his feet; it occurs on quite different types of shore – exposed reef, loose rock or sand. His first impression was that he himself caused it by treading on seaweed bladders, but this was presently discounted by its occurrence in areas where there was no wrack, or at times when he was standing quite still. Speculations as to the sound being caused by bivalves, sea-urchins or crabs were also rejected.

Kenya Casebook

Then one day, as Carpenter was resting on his stick while scanning the exposed reef below the Mombasa golf course, a particularly loud smack came from directly beneath his stick to which it transmitted a shock as if it had been struck; prompt investigation revealed that the stick was covering a deep hole in the coral in which he could distinctly see a long arm of one of the small-bodied feather stars. Even while he looked the noise was repeated, so there was no longer any doubt that it came from the slender burrow occupied by the starfish, though how such a creature could produce so loud a noise was far from clear. As I also had occasionally heard these explosive pops along the East Coast, I was naturally curious to discover the true cause; hence recently I contacted Mr Frederick M Bayer of the United States National Museum who is an expert on the marine life of the Indo-Pacific. Mr Bayer explained that what Dr Carpenter took to be a feather star, or crinoid, was more probably a brittle star with pinnate arms; they live in holes, which feather stars do not normally do.

Dr Fenner A Chace, curator of crustacea at the National Museum, to whom I had written, replied that both he and Mr Bayer “agree with you that the crackling and popping sounds that are heard along tropical shores usually emanate from snapping shrimps of the genera *Alpheus* and *Synalpheus*”. Mr Bayer pointed out, however, that Dr Carpenter’s specific encounter with one of the noise makers suggested that perhaps a stomatopod of the genus *Gonodactylus* was involved. These so-called mantis-shrimps are responsible for a least some of the noise usually credited to snapping shrimps; they do not possess the socket and plunger apparatus that the snapping shrimps have, but produce the noise by flicking the terminal joint of the raptorial claw rapidly outward against some hard object such as the coral rock in which they live. They reach a length of three or four inches and are likely to be found in holes in the reefs like the one in which Dr Carpenter saw the starfish. Unlike the snapping shrimps, which usually retreat from any object thrust near them, *Gonodactylus* will stand its ground and snap at the object, inducing the shock that Carpenter mentioned. For this reason they are often called “split thumbs”.

Chapter 16

RAIDING ANTS AND MIMICKING SPIDERS

In all probability it will not be lions or elephants that provide a newcomer with his or her first impressions of Africa's fauna, but the abundant insect life – especially the ubiquitous ants. For our benefit RL Harger vividly described (1922:17:69) conditions at the coast following an afternoon of heavy rain that, after dwindling to a drizzle, completely ceased an hour before sunset; the still, damp air seemed chilly by comparison with the muggy heat that had preceded the downpour and the earth, having remained much warmer than the atmosphere, had produced a slight haze which was quite noticeable even fifty yards away. The subdued light and general conditions appeared to be favourable for many forms of insect life, particularly those which rely on their legs for transport.

But what a world to face for those whose eyes are but one sixteenth of an inch above the ground and unable to focus far ahead; for an ant the hazards are innumerable. Even where we stand, on a slight track worn by the bare feet of Africans, there are tussocks of bedraggled grass the bowed stems of which are now a sodden and tangled mass, there are many puddles of water surrounded by soft mud and occasionally a larger pool where a matt of dead leaves still retains the washout that held them together and on either side there lie countless obstacles of considerable magnitude – to an ant – fallen branches and twigs, now partially embedded in mud but destined, when dry, to provide food for vast numbers of termites.

Thirty feet ahead of us our roving eyes catch sight of a blackish streak on the path; it seems to be moving towards us, disturbing a nightjar that momentarily distracts one's attention. Now the black line, which is about five feet in length, appears to be telescoped, reduced, perhaps, by a slight dip in the path but still the line comes on until one can see that this is a slightly irregular column composed of ants, large black ants (*Paltothyreus tarsatus*), marching five or six to a row. Observe their antennae, the downwardly directed tips of which are periodically raised for a second or so as if to pick up some wireless message; each individual is well separated and self-reliant though forming part of a seemingly well-disciplined host. Three or four inches ahead of the main body are half a dozen scouts who, constantly falling back, are replaced by others. Take a stick and score a rut across the path – the leading ants halt while a few willing investigators dart forward and the head of the column expands slightly. No danger! On they go, passing through the rut and recovering formation on the further side. Try placing a stone right on their line of march; again there is but a momentary check in the steady advance, then the column winds round the obstruction and continues on its way at a speed of something like ten yards per minute. From a clump of grass a small brown cockroach, carrying a cachet of eggs, darts out in an attempt to cross the path but, nearly colliding with the advancing host, scurries back; the ants ignore her, seemingly having some objective in view which concerns every member of the party.

The orderly march continues a little longer, then, following some slight hesitation on the part of the leading ants, the head of the column opens out; instantly the entire formation dissolves as each individual, with a sudden access of speed, breaks away, to one side, almost at a right angle to its

former line of march. So far as one can see there is nothing to account for this sudden and synchronised dispersal. Five or six feet away, however, is a small open space on which lie many sticks amid a tangle of grass stems, now sodden and prone; upon reaching this area every ant starts to use its jaws to remove bits of mud and vegetation. At times this demands all of their insect strength, so here and there, as they tug or lift, black bodies are seen to curve with the effort. Soon other jaws - yellow jaws – appear from below. Evidently it was termites that felled the stems of grass, when dry, and their warriors are now preparing to defend the workers. The fight is now on over an area covering five or six square feet. Owing to the recent rain no surface earthworks are visible but the black ants rapidly open up the runways of the “white ants” and, as those lovers of darkness are exposed they are promptly seized; a few of the defending warriors leave their tunnels and wander aimlessly about, their gaping jaws upraised in readiness to bite. The bite of a soldier termite is a formidable thing and when a pair of those yellow jaws is successfully buried in the body of an ant, the latter is seen to writhe and curl in a death-struggle. Half a dozen of the raiders are so injured that they can scarcely move; a few, their limbs sticky with termite saliva, are dragged underground – more often, however, it is the helpless termites who are seized from the side or from behind.

Black ants are now scouting in every direction and continue to expose more subterranean passages; after about three minutes of combat and activity, these outlying raiders suddenly cease work as if by a prearranged signal. One moment they are feeling the air, the next they are falling back towards the main body, already moving towards the pathway from which the attack was launched; at least one motionless white victim is carried in the jaws of almost every black raider. Nearly, but not all, for as the column reforms and heads for home it is seen to be led by unburdened ants, a few more are irregularly scattered along the flanks to act as scouts while some more bring up the rear. Once again the whole party resumes its steady march. Away behind them comes a straggler making desperate efforts to rejoin his companions; though he acts like a lame horse in a hurry, his pace is slow for something is attached to one of his hind legs. Harger stoops to investigate, the tiny fragment of dry vegetation is stuck to it by some viscid substance, probably termite secretion and, with the help of a grass stem, Harger pins the obstruction to the ground. The ant struggles, frees itself and hurries after the departing column with all the speed that it could muster and, despite the expeditionary force being many feet away by this time, the lone ant succeeds in overtaking them.

Maintaining its customary marching pace the returning column eventually reaches a point where, without a moment's hesitation, it leaves the path and enters the long grass where, doubtless it will disappear down some hole at the base of a tree or beneath a stone. The sun has set, however, and the fading light makes further observation impossible. The raid of the ponerine ants is over – an action involving 30 minute's march and a three minute struggle. So impressed was Harger by the “cohesion, mobility, elasticity and unity of action” displayed by this community of ants that he feels, for him, the word “instinct” is quite inadequate to express the organisation in all that he had witnessed.

From a human point of view, of course, the worst of all such raiders are the dreaded army ants (*Dorylus*), sometimes called safari ants, though best known by their Swahili name of *siafu*. Except by flight it is rare indeed for any living thing to escape their unwelcome attention, so a note by PRO Bally (1941:70:57) is of special interest; having observed that the large white slug, so common in the wetter forests of Kenya where *siafu* abound, appears to have no protection from these voracious insects, he related the following incident. A six inch long slug was present on a branch that fell right across a track in front of some on-coming *siafu* which promptly swarmed all over it. When the blind

insects discovered the slug they attacked it in such numbers as to almost entirely conceal the mollusc which immediately withdrew its horns, contracted slightly, but otherwise remained motionless. After seemingly sinking their jaws right into the slug, the ants too remained quiescent and, following the initial excitement of their discovery, the main body of *siafu* fell into line of march and continued on their way, leaving their companions still covering the apparently helpless victim. For a few minutes nothing happened; but then a gap appeared in the mantle of ants and through it the slug emerged unscathed, leaving behind it the cloak of exuded slime. Not one of the ants seemed to realize that their prey was escaping for they remained with their jaws still buried deep in the discarded covering of slime shed by the slug.

Another common tropical species is known as the tailor-ant (*Ocephylla smaragdina*). JE Marson came to know this widespread insect in Ceylon and Burma as well as in East Africa; tailor-ants are particularly fond of nesting in mango trees and Marson (1946:85/86:62) remarked on how interesting it is to watch the insects constructing their nests at the end of a bough. Some ants form parallel rows at right angles to the edge of a glossy green mango leaf and, meanwhile, another group takes hold of a second leaf and slowly the two are drawn together. When the edges meet they are “sewn” together with silk spun by ant larvae brought for the purpose and held in the jaws of other members of the community. Brush against one of these nest-bearing branches and the ants shower upon one, biting so fiercely that the reason for their Swahili name – *maji moto* (hot water) – is unlikely to be forgotten! Such a formidable insect is likely to be respected by all but the most ant-hungry predators; consequently it is not surprising to learn from Mr Marson that this ant has several mimics among spiders which presumably benefit from the resemblance. A very striking one, as shown by the coloured plate¹ accompanying the article. Marson divides such mimics into “physical” and “ecological” groups. The physical resemblance of a spider to an ant naturally provides protection from these creatures that normally prey on spiders; on the other hand an ecological mimic, habitually living in close association with ant colonies, derives the protection afforded by numbers. The chances of an ant-predator picking up the occasional spider from among a host of ants being relatively light.

Of the tailor-ants’ numerous mimics Marson mentions the East African *Myrmarachne foenissex*; not only does this spider resemble *Ocephylla* in form but, assuming antlike postures, it displays antlike movements. The abdomen of the spider is elevated and held at an angle similar to that of an ant’s abdomen; meanwhile, walking on only three pairs of legs, the spider’s additional or foremost pair is raised and waved about in much the same way as would be the antennae of an ant. This waving of the forelimbs, observed Marson, is not peculiar to *Myrmarachne* but is merely an accentuated development of an action that is common to other genera of the family of Salticidae (jumping spider) of which *Myrmarachne* is a member. It would appear that in both instances the forelimbs possess some sort of sensory perception; place one of these ant mimics on your hand with a finger-tip just in front of it and, while standing still, *foenissex* will put its forelegs on the finger and move them over it.

The rapid movements and jumping displays indulged in by most members of the Salticidae are in evidence only when the spider is suddenly disturbed; then, betraying itself as an imposter, the spider will move to the underside of a leaf in a manner that is far from being ant-like. Such salticid movements, however, are normally suppressed and, when walking, the antlike motions of the spider are really remarkable. Both sexes are almost perfect mimics following the fifth moult after which sexual dimorphism is apparent and both male and female mingle freely with their models, running

¹ Unhappily the caption contains a slight misprint where an ‘s’ has been substituted for a ‘d’ in the name and the printer had capitalised the specific names of both model and mimic.

along in their columns without interfering with the ants in any way. This interested Marson, for another small spider (*Marpissa melangnathus*) had been reported by G Bhattacharya as waiting beside ant columns and periodically pouncing on the processionnaires to rob them of the food or eggs that they might be carrying. With a view to checking his own observations, made at Toungoup in Burma, Marson and a colleague took two cellophane bags and in each they placed a pair of *M. plataleoides*, the Indian mimic of *Oecophylla*, together with a mango leaf. To one bag they added two tailor-ants and to the other a couple of froghoppers. The latter were killed and eaten within a few hours but two days later the ants were still alive though the female spider in the same bag had been eaten by the male¹. Flies, plant bugs and other small insects seem to be the main food of these spiders at all stages of development.

During the first four moults the spiderlings undergo considerable changes in colour, at different stages representing different species of ants and just before her sixth moult, to the upper surface of a leaf, the female spins a fine cover web beneath which she retreats for the final moult. This last moult is unaccompanied by any external change in her form but not so with the male, however, for after his sixth moult his chelicerae – instead of remaining small like those of the mature female – are greatly developed, in fact equalling in length the combined length of his head and thorax. It is after this sixth moult that mating takes place and the female proceeds to reinforce her cover web with patches of closely woven white webbing; she then lays from eight to a dozen white or yellow eggs over which she spins two further layers of protective webbing. Five or six days later the eggs hatch and, after a period of about the same duration, the hatchlings leave the web. For the few remaining days of her life the mother spider stays beneath her protective web except when she emerges in search of food; should an ant approach her she displays a striking change in attitude towards her model, scurrying back to seek refuge in her web. Curiously enough her behaviour is just the opposite to that now adopted by her mate, whose days are spent in standing guard beside the web; if this is approached by an ant he promptly chases the trespasser away, though never actually attacking it so far as Marson could see - on their part, the ants usually fled at his approach. Further observations of these ants and their mimics will be found in the article, from which enough has been extracted to show what a world of interest may be found in the subject.

Ants are by no means the only Hymenoptera² with which spiders have intimate relations, for many kinds of wasps have come to depend on spiders to feed their offspring! A dead spider decomposes rapidly, however, so the maternal wasp paralyses its victim by thrusting her sting into its nerve centre; in this condition the hapless spider may be stored until such time as the eggs of the wasp hatch out and the hungry larvae are ready to consume it. Surprisingly enough scant attention has been paid to this fascinating subject in the pages of the Journal.

The first is when JK Creighton, evidently an amateur microscopist, invited attention (1912:4:138:figs. 1-4) to the immense variety of spiders, mostly undescribed, to be found in East Africa. Commenting on the difficulties of obtaining certain species, he observed that mason-wasps might be potential, though involuntary, allies. One of these common insects attached its mud nest to a corner of an unmounted water-colour painting that was hanging on Creighton's wall and the nest grew so rapidly that a few days later Creighton removed it in order to save the picture from damage. Already the nest was found to contain approximately 200 spiders! No other insects were represented and quite a large proportion of the spiders had lost a leg or two, possibly when struggling with their enemy; most were web-makers but a few jumping spiders were included. The latter stalk and then pounce on their prey; before taking off a hunting spider sometimes opens its

¹ Should one express relief at this reversal of the usual trend in sex relations among spiders?

² An order of the Class Insecta comprising ants, wasps and bees.

spinnerets and attaches a silken thread to the spot, then, should it miss its quarry, the spider quickly climbs back up the thread by means of its comb-like claws.

With so many foes it is not surprising that spiders have developed a great variety of protective devices; these formed the subject of an address to the Society by Major RW Hingston that was later printed in the *Journal* (1929:36:149:figs. 1-15). After referring to the fact that countless insects come ready camouflaged in both colour and shape to represent bark, leaves, sticks or other natural objects in their environment, Hingston remarked that many spiders have achieved similar results by constructing their own camouflage. Sitting in the centre of its wide-spreading web, the spider is as conspicuous as the hub of a wheel, indeed the radiating lines of the orb, like the spokes of a wheel, tend to direct attention to the centre. Gathering together fragments of its own victims, the spider binds them about with silken threads to form small motley-coloured pellets the size and shape of which correspond to those of their maker. Four of these dummies constitute the normal complement and, suitably spaced, the spider fastens them in a row across one axis of the web. Then, with legs inconspicuously withdrawn, the arachnid itself crouches in the centre – a pellet among pellets. So close is the resemblance that a casual inspection is unlikely to detect the spider, unless the inspector is aware that the spider is always the central object.

Should a cruising wasp attempt to pounce on one of the five “pellets” the spider has a four-to-one chance of making its getaway; this it does by abruptly dropping from the web on a silken thread till it comes to rest among the débris-littered ground where it would take some finding. There are numerous variations of this technique and diagrammatic sketches of fifteen of them illustrate Major Hingston’s article, most of them drawn from regions other than East Africa. One from the Andaman Islands, however, is of a genus (*Gasteracantha*) with many representatives in Kenya and Tanganyika; in my experience the bizarre-looking members of this group exhibit a tendency to sling their webs above shady forest paths at an inconvenient height, being about level with one’s face!

Gasteracanthid spiders, though of diverse shapes, are characterised by hard and spiky cephalothoraces whose projecting “thorns” or “horns” are frequently out of all proportion to the spider’s body. Whereas East African *Gasteracantha* are often gaudily coloured, the angular Andaman Islander is black; for such a one no advantage would accrue from the presence of rounded or oval pellets in its web – so, from the discarded fragments of past feasts, the Andaman spiders construct irregular-shaped packages of a blackish hue. As many as four of these packages are scattered about the web where they presumably serve as decoys. Should one of these be seized its removal imparts a vibration to the web that warns the owner to efface itself.

Some spiders – Major Hingston’s illustration is drawn from the Guianas, but I rather think that I have seen the same subterfuge adopted in Uganda – instead of utilising the remains of prey, place suitably-sized fragments of bark at intervals along the vertical diameter of their webs, then take up a position in the centre in the same way as do the pellet-making spiders. Yet another kind weaves silken cocoons about its eggs and places a string of these cocoons along the vertical axis, according to posterity the privilege of sharing their parent’s risks!

Chapter 17

OF WASPS AND THEIR PREY

Even after World War I library facilities in Nairobi were still very meagre, so I recall the pleasure afforded by Professor GD Hale Carpenter's illustrated article (1919:15:440) on Fossorial Hymenoptera – "Fossorial because they dig! Hymenoptera because they belong to the great group of insects" whose fore and hind legs interlock as one for the purpose of flight. Aided by the accompanying coloured plate, I was able for the first time to learn the names and more of the habits of the many species of wasps that I had been observing during the previous five years.

One of the most familiar wasps to me was the slender-bodied, long-legged, canary yellow and black *Sceliphron spirifex* which, with its allies, is detested by housewives for the way that it insists in plastering the backs of pictures and books, or other objects, with tiers of tubular mud-nests. Each one inch long tube has a diameter about that of an ordinary lead pencil and constitutes a complete unit; the addition of further cells is somewhat fortuitous. The wasp begins building a cell from one end and completes it in sections, each of which represents a pellet of mud, the size of which is comparable to that of a sweet-pea seed; no sooner is one pellet finished than the busy insect flies off to fetch another, bringing it in her mandibles. Carpenter timed the wasp's activities, ie the number of pellets – corresponding of course to the number of visits – made by one *Sceliphron* in the course of an hour; the period of absence varied as much as from two to seven minutes for it included flight to the nest, collection of mud and formation of the pellet, return journey and the time spent in plastering. The average time was 3.6 minutes for the eighteen visits made between 8.45 and 9.47 am. Apparently the cell was completed in that time for the wasp did not return during the succeeding half hour, at the end of which Carpenter himself left.

In due course each completed cell is stored with spiders, on one of which the wasp lays an egg; as mentioned in the previous chapter, a great variety of species of spiders may be present and frequently every spider in a given cell, said Carpenter, belongs to a different species, though the majority are plump-bodied web-spinners. In five cells built by a single *Sceliphron* a total of 68 spiders were found; the number in any one cell, however, showed considerable variation – from one to nineteen in the 29 cells examined by Carpenter. The solitary spider was but little larger than those in the better-stocked cells, so it would appear that some wasp larvae are inadequately provided for, while others have a superabundance of food.

From an hour after sunset, commented Carpenter, the little banda (grass hut) from which he wrote was resonant with noises made by the industrious insects. The first indication of a fresh arrival was the sonorous hum which resulted in the name bumbuzi being bestowed upon *Sceliphron* by the Baghanda; then, as the wasp alights with a fresh pellet of mud and swiftly spreads it, the note changes to a high-pitched rising and falling buzz that is quite characteristic. How this sound is produced by *Sceliphron* Carpenter was unable to discover, but thinks that it may result from rapid vibration of the wings; if that is so, he suggested that it is analogous to the quick, though restricted, vibration of the folded wings indulged in by certain hover-flies of the family Syrphidae – a hover-fly

is able to produce a gradually rising, high-pitched note while stationary on a window-pane.

“Singing” while you work is apparently a prerogative of the Sphegidae, sometimes it is in the form of an intermittent buzz that first attracts one’s attention; when traced to its source the sound seems to come from below ground and if one advances slowly while scanning the surface one’s eye will probably detect a little heap of freshly excavated earth lying beside a small round hole. Even as one watches, an elongate but slender-bodied insect backs from the hole bearing between her forelimbs an “armful” of earth which she deposits on the heap, often to the accompaniment of a little buzz, as if of satisfaction. Returning to the hole the wasp disappears down the tunnel from which renewed buzzing indicates that she is again exerting every effort to loosen the soil. Had one come across the wasp when she was beginning her task, one might have noticed that she first employs her powerful forelegs to scrape up an “armful” of earth; should, however, the ground prove to be too hard, or the site to be barred by some obstruction such as an embedded pebble, the wasp employs her jaws to loosen and remove it. Such an interruption always results in a buzz, almost as if the insect is protesting at being hampered in her task. It will be noted that fossorial wasps invariably appear to be working at very high pressure – their antennae vibrating and wings flicking with super-abundant energy.

When at last the burrow is completed to her satisfaction, its terminal chamber being several inches below the surface, the sphegid is likely to conceal the entrance; this she does by selecting a few tiny stones which she seizes in her mandibles and wedges into the opening. Then, turning away from the site, she flicks back fine earth until the mouth of the burrow is completely concealed; a careful inspection of the place follows and not until this proves satisfactory will the wasp depart on a hunt. As she flies off one may see her quartering the ground in search of the particular kind of prey to which she is partial – maybe a caterpillar, cricket, grasshopper or other orthopteran. Alighting at a likely spot she hurries hither and thither, antennae and wings in constant motion, as she searches the area; suddenly she pounces, there is a brief rough-and-tumble as she seeks to sting her victim and carrying it, the successful huntress flies back to the burrow. There she sets down her burden while reopening the entrance and paying a hasty visit to the chamber to see that all is as it should be. Returning for her prey, the sphegid drags the paralysed provender down the burrow to the terminal chamber and, before leaving it there, the wasp deposits an egg on the inert insect; once outside, with her tail still pointed towards the burrow, the industrious mother flings loose earth backwards with so sure an aim that it falls into the hole. Filling the cavity with loose earth, however, does not satisfy her, for in time it would sink and the resulting hollow would betray the existence of her excavation. So, periodically during the filling process, the sphegid turns around, takes a firm hold on the sides of the burrow with her third pair of legs and, employing the front of her broad head as a battering ram, she presses and packs the loose soil, accompanying the effort with a buzz. Occasionally she may pick up a tiny stone in her mandibles, insert it in the burrow and ram it down along with the soil; finally the wasp scratches loose earth over the site, makes a thorough inspection to satisfy herself that there is no indication of a burrow beneath, and flies off to refresh herself at some flower before repeating the whole laborious business.

There is another large family of wasps, the Pompilidae, the habits of which are essentially similar to those of the Sphegidae except that, so far as Carpenter was aware, they provide their offspring only with spiders; even the biggest mygales – which in East Africa are commonly called “tarantulas” by Europeans – are not immune from attack. A striking difference is displayed by a pompilid when engaged in replacing dirt in her excavation; whereas, as already noted, a sphegid uses the front of her head to ram the earth home, a pompilid does precisely the opposite; standing over the opening, the wasp reaches down with her tail which she employs to tamp down the earth, usually with slow

steady movements.. On one occasion, however, Carpenter observed a pompilid strike a series of quick blows, her whole body vibrating with such rapidity that the outline was blurred; it bore some resemblance to the operation of a pneumatic riveting hammer! So consistently different was the procedure between members of the two families that were Carpenter to be given a wasp and asked whether it was a pompilid or a sphegid, he would feel inclined to reply, "Let me see it filling its burrow and I will tell you".

There is just a possibility that some pompilids may not go in for excavating burrows. One day Carpenter was in Teso Forest he observed a typical blue-black wasp of medium size pounce upon a spider; seemingly she did not sting the arachnid but merely laid an egg upon it before departing. Was this an aberrant fossor that, having lost the burrowing instinct, was content to lay an egg upon her living prey as do parasitic flies of the family Tachinidae? And what of the loud buzz with which a pompilid advertises her every activity? Carpenter is confident that it serves to warn insectivorous creatures to leave the wasp alone; he pointed out that many of the larger species make such a rattling sound when in flight that they are frequently heard before they are seen and involuntarily one's attention is attracted by the noise which resembles that produced by an ill-made clockwork toy. Obviously if such a noise accompanied the flight of an edible insect it would hasten the creature's demise.

Carpenter could recall no insects other than pompilids that employ sound to announce their presence while going about their daily business. Stridulating noises are emitted by many beetles, certain bugs and stink ants (*Megaponera fostens*) when molested; such noises, however, are more in the nature of intimidating reactions. Pompilid self-advertising is not confined to sound but correlated with a blue-black livery of both body and wings, often accompanied by conspicuously bright yellow antennae and legs; these visual and auditory aids to identification should serve to remind would-be predators of the painful stings that all pompilids are capable of inflicting. One might add that – apart from its use in preparing prey for her offspring – the powerful sting of a pompilid is employed only in self-defence when personally molested.

With burrowing wasps so capable of taking care of themselves and providing for their offspring, one cannot help wondering what it is that keeps them from multiplying to excess; the answer, said Carpenter, is other insects which are directly or indirectly parasitic on pompilids by appropriating for their own offspring the prey stored up by the wasp for its larva. This may take place during the fossor's journey to the burrow with her helpless captive, especially if the latter is so heavy that it has to be set down while the bearer rests or, upon arrival, while she is engaged in opening up the burrow or inspecting the chamber; thus are furnished opportunities for an alert pirate to dart down and deposit its own egg upon the fossor's inert prey. It would seem as if some fossors are almost aware of this danger for on one occasion Carpenter, having frightened away an *Ammophila* that had already placed in the burrow a caterpillar on which she had deposited an egg, removed the caterpillar and laid it on the ground near the entrance. When the shegid returned she examined the caterpillar very carefully and, finding on it the egg she herself had put there, sucked the ovum dry before laying a fresh one! Her action amazed Carpenter and left him frankly puzzled as to the correct explanation of such behaviour. As tachinid flies are known to attach their eggs to the skin of caterpillars – rendering such prey useless for rearing the fossor's larvae – it may be customary routine with certain wasps to destroy an egg they may find so attached.

One small wasp (*Sphex luteipennis*) is intensely suspicious of any insects approaching near the grasshopper she had captured for her offspring; with mandibles wide open she will charge fiercely upon even the smallest ant whose wanderings have inadvertently led it near the scene of the wasp's

labours. Startled and confused, the hapless ant is likely to retire hastily. Close to the burrow of some fossorial, such as the black-and-yellow, vespid-like *Bembex capensis*, one often sees a small brown fly (*Idia*) quietly awaiting her opportunity which comes when a careless *Bembex* departs – as sometimes happens – without closing her burrow. When this happens *Idia* attempts to enter in such a hurry she sometimes tumbles “head over heels” in her anxiety to deposit her own eggs in the *Bembex* larder; usually, however, the entrance has been temporarily closed by *Bembex*. On such occasions the fly, obviously working against time, feverishly seeks to find a way in, but hastily withdraws if *Bembex* returns; the risks attendant on being caught are serious for, though Carpenter never observed a *Bembex* take notice of the fly, he frequently found *Idia* that had paid the penalty of being stung and stored along with similar food for subsequent consumption by the *Bembex* larvae. But also in *Bembex* burrows one frequently finds small larvae of a two-winged fly – presumably those of *Idia*; possibly they do not attack the *Bembex* larvae but, acting as scavengers, devour the debris left by the fossor’s offspring.

On suitably sandy spaces such as occur around the shores of Lake Victoria, many *Bembex* may be seen working in close proximity; they present a scene of activity incomparably more hectic than that displayed at the nests of ants or bees. At first the onlooker may not be greatly impressed, seeing nothing but a number of wasp-like *Bembex* resting on the sand or taking off with so rapid a flight that the eye cannot follow them; these are but the idle males whose dashing flights are presumably in search of mates, for they have no other obligations. In such terrain there are likely to be tsetse flies (*Glossina*) either buzzing about one’s person or settling on one’s puttees; in the event that a *Bembex* is likely to appear, flying around and around at about knee-height as she seemingly investigates one. There is no cause for alarm, however, for it is not one’s self that she seeks but a plump tsetse bloated with one’s blood. Failing such she will select the biggest tsetse that she can find, probably a gravid female swollen by the presence of the large larvae that she carries; having chosen her victim *Bembex* pounces on it with a rush and as the unfortunate tsetse is stung, it emits a short, and almost squeal-like, high pitched buzz. If one is quick enough one may see the *Bembex* dart away with the paralysed prey held between her middle pair of legs. Alighting on the sand at a spot that appears to be no different from the surrounding ground – though the wasp recognises it – *Bembex*, still holding her prey, starts work. Without a moment’s delay she begins reopening her burrow, using for the purpose her powerful, bristle-bearing forelimbs. Digging is but a feeble term to express the energy that she displays; so rapid are the movements of her forelimbs as she flings back the sand, that a continuous shower of it passes beneath her body to fall several inches to the rear. Undeterred by the continual sliding of loose sand into the excavation, *Bembex* perseveres with her digging until the opening is cleared. Sometimes in the process the pile of excavated sand grows so large that it again starts trickling down the burrow but when this happens *Bembex* goes round to the far side of the pile and digs her way through till the burrow is safe from further lilliputian avalanches. All this time *Bembex* has held on to her precious full-fed or gravid tsetse, awaiting the moment when she can carry it down the burrow. Other biting flies may have preceded it for in the nest-chamber of a *Bembex capensis*, Carpenter found the remains of both *Chrysops brucei* and *Tabanus thoracinus*.

For three and a quarter hours Carpenter watched the burrow of one *Bembex forcipata* and during this period the wasp carried 29 tsetse and two other flies down to her chamber; on opening the burrow Carpenter recovered 31 tsetse. From another burrow he removed a more than half-grown *Bembex* larva, placing it in a pill box where it devoured nine tsetse in the course of 24 hours; this suggests that from 40 to 50 flies must be required for each larva, assuming that it takes about a week before a larva is full-fed. The full-fed larva spins a neat pear-shaped, silken cocoon in the outer covering of which are embedded grains of sand. Within its cocoon the grub changes to a

quiescent pupa, from which in due time an adult *Bembex* will emerge.

Unlike the sphegids and pompilids, which prepare a chamber for the reception of a solitary paralysed insect on which an egg is laid before the burrow is permanently closed, bembecids have to keep their growing larvae supplied with fresh food. The nature of the food – two-winged flies – may provide the explanation. For flies are not fleshy insects and would probably dry up if stored in sufficient numbers to provide a larva with all the nourishment necessary for it to attain full growth. So day after day the bembecid has to go hunting flies, sting each one and transport it back to her hungry offspring; this, of course, entails reopening the burrow every time - possibly the reason why bembecids apparently always select loose sand for their nesting operations. With so much to do it is little wonder that *Bembex* mothers seem to be in a feverish hurry as they go about their daily tasks.

Carpenter contrasted these industrious fossors with one East African species that has either abandoned, or never developed, the digging habit; this is *Scolia ruficornis*, a handsome blue wasp with red antennae. At certain times numbers of them may be seen quartering the ground; occasionally one may even scratch at the soil in its search for the fat larvae of large lamellicorn beetles that live just below the surface; when one of these is located it is stung to render it helpless but left where found after an egg has been laid upon it. In this way *Scolia* has eliminated all problems of transport and excavation.

Mention was also made – for the purpose of comparison – of the common, dark-brown wasp (*Belongaster griseus*); the abdomen of this hornet, as it is frequently called, is attached to the thorax by a slender pedicle. Owing to its custom of attaching its papier-maché nests to ceilings or doorways, this insect is the bane of householders. The parchment nest hangs by a fine stalk with the cells opening below so that the larvae are suspended head downwards. *Belongaster* is so plentiful that it is not difficult to find one whilst it is out hunting, and possibly witness her discovery of a suitable caterpillar. This she stings – often in several places seriatim – then, using her mandibles for the purpose, she reduces the inert insect to pulp, makes it into a ball and carries it back to the nest where other wasps assist her in distributing it among the larvae. Carpenter considers this technique a decided advance over that of *Bembex*. The preliminary stinging of a large prey renders it helpless and consequently easier to pulp than if it were alert and active; however, the method admittedly involves supplying each larva with fresh food during its entire life and it also has to receive a certain amount of careful attention.

Chapter 18

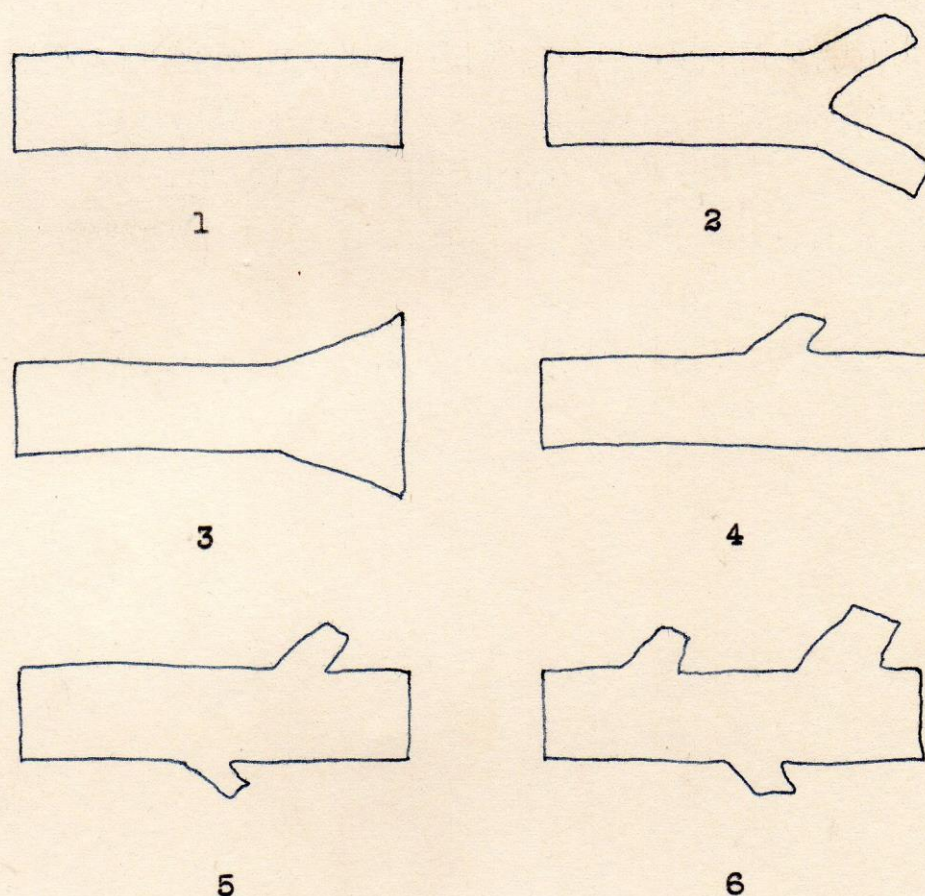
AKAMBA APICULTURE

Apiculture may seem a misuse of language to anyone familiar with the destructive techniques employed by the honey gatherers of most tribes. Superficially the African wild bee (*Apis mellifera adansonii*) appears to be indistinguishable from its domesticated relative in Europe but it possesses a longer sting and this it uses so effectively in defence of its own that it sometimes causes the death of enemies – real or potential.

The relations between these insects and the Akamba form the subject of an illustrated article by JK Thorp (1943:77/78:255-273) who wrote from Marsabit in the Northern Frontier District of Kenya Colony; the author acknowledged his indebtedness to Lindholm's work on the Akamba¹, now one of the largest Kenya tribes. Their territory is bounded on the south by the Athi River and to the west by the Ulu-Yatta-Kikumbulyu ridge that slopes downwards from the Kikuyu Highlands; to the north and north-west it is flanked by the Tana River but to the east and south-east there is no physical boundary and there the Akamba mingle with the Galla and Nyika peoples. In this somewhat inhospitable terrain (3° south of the Equator, and from 37° 15' to 39° east) there are two rainy seasons of which the major one commences in March and normally concludes in May but occasionally drags on to July; the lesser rains occur in November and December. Precipitation, however, is very irregular and at times may fail entirely, the resulting draughts inflicting great hardship on the people; during these periodic famines many succumbed to hunger, in that of 1898 – 1899 the mortality was estimated at 75% of the population in the affected areas. But that was prior to the coming of the white man and, since the establishment of European rule, roads and transport Government has been able to cope with such situations by administering famine relief.

Though true that the people no longer perish of hunger during periods of draught, every Mukamba is a bee-keeper and in times of scarcity he is naturally preoccupied with procuring food for himself and his family. His hives are likely to be neglected or fall prey to roving bands of honey-seeking thieves; the bees too are affected by prolonged draught, for without rain there are few flowers for them to visit. When climatic conditions are normal the honey season is well under way by early June; as elsewhere, the swarms of bees will construct their combs in hollow trees, rock fissures and other suitable situations and in Ukamba bees are an essential part of tribal culture. Just as other peoples like to own cattle and goats – many or few – so every Mukamba possesses beehives, the number ranging from one or two to one hundred or even two hundred. From these the owner will extract honey at intervals of from six to twenty days just as long as the bees continue to make it. Most hives are of the barrel type, consisting of a section of hollowed-out log as much as one yard long, though sometimes only half that length; collectively such hives are known as mwatu but at least half a dozen variations have received individual names, viz:

¹ KG Lindblom, "The Akamba in British East Africa", Uppsala, 1916, pages 1 – 223. In Thorp's article the name is consistently misspelt "Lindholm".



- Fig. 1. Single-barrel hive or munganu.
Fig. 2. Forked-barrel hive called muwa.
Fig. 3. Tapering-barrel hive muswanyo.
Fig. 4. Hive with single projection kibalu.
Fig. 5. Hive with two projections kithanthatu.
Fig. 6. Hive with three or more projections
is known as kinyanya.

Trees of varying quality are utilised for the manufacture of hives, the most sought after being matula, of which the termite resistant nature of the wood is but one of the desirable qualities; Matulani, ie the place of the matula tree, has become a common place name in Ukamba. Should a hive made

from the palm called ilala – probably the doum palm, of which the wood is tough and stringy – fall from a tree, it has a good chance of remaining unbroken; ilala trees occur in the vicinity of the Athi, Tana and Thua Rivers. A third tree, known as mwongu, has similar qualities to ilala and a hive made from its wood may last as long as ten years or more. Finally there is the wild fig, kuimu, of which several varieties are said to occur in Ukamba; though serviceable, its wood is not as good as those of the other three but has the advantage of being readily procurable. Whilst these are the principal types of tree used in hive construction, apparently a man is free to use any other wood that is available, should he choose to take the risk. Nor is the making of hives restricted to any particular clan or group of the Akamba, indeed hive-making is regarded as a part of every boy's education. Nowadays there is a tendency for those that excel at such work to specialise in it and to make a living by selling the hives that they make.

Thorp lists five tools that are required for the construction of a hive. The heavy work, such as shaping a leg, is performed with a very small-bladed axe known as a mutiothoka; the blade of a kind of adze or chisel, known as ngomo, is embedded in a piece of rhinoceros hide, at almost right angles to the handle. For scraping out the barrel another iron blade (ithoka wa kwasa) is used, the strip of leather (nduyu) that formerly attached it to a long handle (thia) is also of rhinoceros hide. Both ends of the barrel are closed by flat pieces of wood, shaped for the purpose, and in which a hole was customarily provided for the coming and going of the occupants of the hive; for the making of these ends – one of which is removable for the extraction of the honey – a small iron tool known as kwal'ya mbengeo or mbalau is used. Yet another tool, the kyoo, is employed for carving or burning the clan mark on one side of the barrel. These marks, ubano, formerly said to be the same for clan arrowheads, beehives and cattle, now appear to bear little resemblance to one another; furthermore each village of a clan frequently has its own special mark and even this may be varied slightly by individual beekeepers, so it is scarcely correct to call them "clan" marks. Should it ever happen that the marks of two villages were found to be indistinguishable, a gathering of representative elders from the villages concerned is called and, after due consideration, they decide which village has to make the necessary alterations. Should, however, the marks be removed or altered for the purpose of theft, or even by accident, it is believed that the person responsible will die within a short time. This automatic calamity does not apply to an individual who removes the section of a hive bearing the mark and substitutes another piece of wood for it.

Following the fashioning and seasoning of the hive, before it can be considered ready for occupation, within it must be burned twigs and leaves of certain aromatic trees known as juuta, munondo and muraa; various reasons for this treatment are advanced, primarily it is to remove any minor projections within the hive, the bees allegedly preferring it to be quite smooth. Not only is the aromatic odour, that clings to the hive afterwards, supposed to attract bees but is believed by some to deter snakes from entering; as further inducement the inside of a hive may be smeared with honey placed in it. Finally a fragment of honeycomb is rubbed against a piece of mutton and a species of lizard known as inyolo is introduced into the hive; the future occupants are then adjured to be as peaceful as the lizard which, like the sheep, is known to be inoffensive – this final ceremony is intended to counteract the well-known fierceness of the wild bee¹. The hive is now ready for installation and is carried to the site by the owner or one of his sons; however, as burden-bearing is

¹ The story introduced at this point by Mr Thorp, stating that the Germans attached trip wires to the beehives around Tanga in 1914, has been denied by General von Lettow-Vorbeck who attributed the rousing of the bees to the machine-gun bullets whizzing through the trees in which their hives were situated. Furthermore, the General stated that his own troops, no less than the British, had to retire as the insects – which failed to distinguish between British and Germans – pushed home their attack.

customarily woman's work this is somewhat surprising but among the Akamba everything connected with beekeeping is considered a masculine prerogative, apart from the transport of honey. Usually the hive is taken on the bearer's back where it is held in position by a tump cord made of plaited grass or banana leaves.

The selection of a site depends on several factors. It may be in open, sparsely inhabited bush, or on common land (weu) where any member of the clan is free to place hives, graze his stock, or cultivate the land; the hive must not be placed on ngundu, that is land which is owned under a complicated system of land tenure by another, though it goes without saying that a man may place hives on his own ngundu. Neither must the hive be placed in a tree sacred to ancestral spirits (aiimu). A good location is one with an abundance of wild flowers to provide nectar but too many hives will result in a shortage, so sufficient space must be available for the new hive. It is by no means unusual to see as many as fifteen hives fixed in a single giant baobab (mwamba), one of the most popular trees for the purpose; wooden pegs are driven into the massive trunk to serve as steps by which the beekeeper can ascend to the upper branches. Sometimes a hive is lodged in a seemingly inaccessible space and, occasionally, when collecting honey a beekeeper may be injured or even killed by a fall. Usually a fork (mwaka) suffices but one that is especially suitable for the purpose is known as kitumbi; also a hive may be slung beneath a branch by cords but an mboloi, or stick the ends of which hook over the branch, is considered to be better.

Customs regarding the placing of a man's first hive appear to vary in different districts. With some Akamba a man may fix his own hive; others declare that such a thing must be done by a son or brother – though not necessarily a full brother; elsewhere a paternal uncle is the appropriate person. The owner himself must remain celibate until the hive is occupied and the bees commence work on a comb and, when this happens, it is customary for the owner to brew beer, pouring out some of it as a thanksgiving to his ancestral spirits (aimuu). When, by inspection, the owner decides that the time has come to relieve the bees of the fruit of their labours, he will probably solicit the help of one or more friends; each participant must take an oath of celibacy by the kithitu and the said oath must remain in force until such time as the bees recommence storing honey – this is usually about ten days, at the end of which the proprietor revisits the hive. If it has been abandoned or the bees are not engaged in collecting nectar, he concludes that one of the raiding party has violated the oath upon which the owner must prepare a purifying medium known as ngondu and this, together with a piece of mutton, he places on the hive. This will cause the bees to start work almost immediately and six days later they should have again filled the hive.

Should the hive be slung from a branch by means of an mboloi, it will be lowered to the ground to facilitate the extraction of the honey but, if the hive is firmly secured in the tree, the honey is taken from it in situ. The time for this is a cool evening an hour or so after sunset; by then the bees will have settled down for the night and the once noisy hive is silent; close to the tree a large fire is lit and by its light a party starts climbing the tree. With him he takes a stout rope (mwii) made from the fibrous bark of the baobab and to one end of the rope is attached a smooth, triangular block of wood (ngongusu) some six inches in length. On reaching the hive the climber takes up a position, frequently quite precarious, nearby, then drops the free end of the rope to an accomplice waiting below; the block, too, after being passed over a conveniently close branch, is also dropped. At a distance of about two feet from the free end of the rope, the man below fastens a receptacle (kithembi), then to the actual end a bunch of thin sticks which had been bound together after the manner of a Roman fascis, but in miniature. This potential torch, known as umui – as opposed to an ordinary firebrand (kisinga), is ignited at the fire; it hangs smouldering below the kithembi as the man in the tree hauls them up, aided – as soon as the block comes within his reach – by his

Kenya Casebook

companion below. It is also the latter's duty, after the kithembi has been hauled close to the hive, to hold it in position by keeping the rope taut. Taking the umui in one hand, the man in the tree blows on it till it burns brightly, then, with a slow circular motion, moves it close to the entrance lid of the hive. If there is another exit the bees may use it, emerging to cluster on the outside of their home; usually, however, they remain with the queen who has probably retreated to the further end of the hive.

After the first angry buzzing of the swarm has been replaced by a subdued and regular hum, the raider cautiously removes the lid; slowly the umui, which had been held at bay, is advanced until the insects retreat from the first comb. Using his knife to detach this section, the man shakes the comb to dislodge any stray bees, then places it in the receptacle; section by section the process is repeated until about two thirds of the comb have been transferred to the kithembi. Great care is taken to leave about a third of the comb, especially any sections containing eggs or larvae; if half a comb contains eggs and larvae and the other half honey, only the latter will be cut away and the rest allowed to remain. Sometimes, owing to the shape of a hive or other factors, this may not be possible but the entire comb is never taken unless the hive is to be removed elsewhere. Though no one knows better than a Kamba beekeeper the risks involved, he is surprisingly fearless but never foolhardy. Once the bees are well under control he will reach to the far interior of the hive and, with fully extended arm, will cut away comb that may be smothered in a mass of bees which he removes carefully by scraping or shaking so that very few perish; after he has taken all that he wants, the hive is closed, the umui and kithembi are lowered and the operator descends from his perch. On reaching the ground the man removes any stray bees from his person or the honey, thrusts his knife through the combs and puts a lid on the kithembi; this done the rope is coiled and the party sets out on the return journey, using what remains of their umui to light their homeward way.

The collecting of honey from a suspended hive is essentially similar except that the climber lowers it gently to the ground where, with one end propped up on a log or stone, the honey can be removed with greater ease. When this has been accomplished, the hive with its occupants is hauled back into the tree and made fast in its former position. Thorp pointed out that the Kamba technique for extraction of honey, involving the loss of very few bees, is far superior to the destructive sulphur-pit method of clearing a skep as formerly practiced in Europe. Back in the village the comb is pounded to extract the honey which is returned to the kithembi which, in turn, had been used as a receptacle for the robbing of the hive. The kithembi is a wooden cylinder from 8 to 12 inches in length; the bottom is covered with skin and the top is provided with a lid (ndaa). After being filled with honey it is slung from the roof poles of the beekeeper's hut and, for transport purposes, the honey is transferred to a skin bag of triangular shape (ngusu) which, held in position by a leather thong (mukwa) around the forehead, may be carried by a woman. Thorp's article is illustrated by sketches of both mukwa and ngusu with a photograph of women carrying their ngusu; unfortunately, today, these utensils are fast being displaced by empty kerosene tins or enamel basins purchased at the local store.

Thorp remarked on the attachment of a Kamba beekeeper for his wards; marvelling at their industry, respecting their "apparent intelligence" he may talk, even pray, to them at times. According to Lindbolm, when a beekeeper dies his next of kin visits the hives, throwing stones or small clods of earth at them to attract the attention of the bees and, when this has been accomplished, the death of the beekeeper is announced with such words as "Wake up bees; your master is certainly dead but that is no reason for you to stop work or cease to gather honey". While this may be the custom in some parts of Ukamba, commented Thorp, he very much doubted that people so well acquainted

with the ways of bees would actually throw stones at the hive. The hives are inherited by a son, or sons, of the deceased; however, the heir must on no account collect the first lot of honey after his father's death – to do so would be to court his own. This lot of honey should be removed by a paternal uncle, following the performance of a simple ceremony by a tribal elder appointed for the purpose. With beehives scattered here and there in the African bush far from the owner's village, it is quite out of the question for him to guard them but, as a measure of protection, he will spread the news that magical powers have been invoked, so that the hands of a would-be thief are caught fast when he touches a hive, or a snake may be waiting for him when he descends the tree. The theft of honey, or the damaging of a hive, is regarded by the Akamba as so serious a crime, and the offender as so despicable, that a man must be nearly dying of starvation before he can bring himself to rob a hive. Nevertheless, thefts do occur, and in years of famine this may create quite a problem. Punishments vary in different parts of Ukamba but are invariably severe. Thorp stated that prior to British rule, kingoli was applied in all such cases; this is a form of capital punishment ordained after a general meeting of the tribe. Meetings of this kind were called to discuss public policy or to try anti-social crimes, like witchcraft or the theft of honey, which were punishable by death; some said that kingoli would only be invoked for a third offence. Lindbolm recorded a case in which the thief paid a bull and five goats, for a second offence the fine would be doubled and for a third trebled. One informant declared that irrespective of the number of hives stolen, it was customary for the offender to be fined seven goats besides returning all stolen property; another stated that in addition to making restitution of the hives, a cow and goat must be presented to the presiding elders for them to eat.

The arrival of wood and iron buildings in East Africa was welcomed by her wild bees whose swarms were apt to install themselves between the galvanised iron outer wall and its inner board lining. Some did so in the house of RE Dent (1923:18:35) and he could distinctly hear the continual humming of the insects as he sat reading of an evening; the repertoire, which ranged from a "high-pitched squawk to a booming roar", was varied one night by an unusual sound – such as might be made by the fluttering of a bat or large moth. It began beneath the eaves at about 7.30 pm each evening and proceeded to the nest and, for an entire week, this strange noise recurred and when it reached the nest the bees fell silent. Intrigued, and unable to guess the cause, Dent trained a strong light on the wall without and waited for the visitor to emerge; presently he heard something coming and, with a fortunate sweep of his collecting net, he captured a male death's head hawk-moth (*Acherontia atropos*) as it emerged - shortly afterwards it was followed by a female which was also caught. Apart from slight damage received when struggling up and down in the confined space between the outer and inner walls, both specimens were in fine condition; on opening their stomachs Dent found that each contained a teaspoonful of honey. Dent showed them to an African bee expert (*fundu*) who recognised them immediately; however, the man mistakenly assumed that the moths preyed on the bees, adding that after half the bees in a hive had been taken the rest were likely to desert their combs and fly away!¹

¹ Owing to the small size of the opening to most European hives, preventing the entry of this large moth, the fact that it habitually robbed wild bees of their honey escaped observation for a long time. Whilst most hawk-moths have a proboscis of a length that will permit them to probe for nectar deep within the base of flowers, I was informed by my colleague Dr WTM Forbes that the proboscis of an *Acherontia* is reduced to about half an inch. While sufficiently long to reach to the bottom of a cell of honey, its relatively large bore enables the moth to imbibe the entire contents of the cell in a single suctorial effort. Another peculiarity of the death's head hawk-moth is its ability to squeak; it was doubtless this "high-pitched squeak" that Dent had mistakenly attributed to the bees.

POSTSCRIPT

It should not be assumed that the Journal is devoted solely to articles dealing with natural history observations; there are more technical treatises on classification of various groups, lists of the fauna in various areas, day to day accounts of memorable safaris. In addition to contributions on the botany, geology and palaeontology of East Africa, much space is devoted to anthropology and the customs of local tribes as observed by the earlier residents in the region.



Arthur and "Queenie" Loveridge in June 1957 on the occasion of Arthur's retirement from Harvard University.

LIST OF CONTRIBUTORS

The accounts of eighty five contributors to the Journal of the East Africa Natural History Society provided source material¹ for this book; these contributors are as follows:

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Blom-Bjorner, S (1945)	Leakey, Mrs Beryl (1944)
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Harper, EW (1914)	Toschi, A (1946)
Henley, - (1943)	Turner, HJA (1914)

¹ Following each name in the text is the year, number of the Journal and page of the original article. It would have been preferable to cite the volume numbers (as has been done in the case of volume 13 only) had this been possible but, unfortunately, the citing of volume numbers has been rendered confusing by vicissitudes of various sorts that have occurred over the years. During world wars, when printing difficulties delayed publication, double numbers were issued at infrequent intervals.

Kenya Casebook

Hickes, GW (1913)	Twigg, HJ ((1913)
Hingston, RWG (1929)	van Someren, R (1910, 1913)
Hobley, CW (1910, 1911, 1913, 1919, 1921)	van Someren, VD (1945)
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Hutchins, DE (1912)	Woodhouse, CW (1911-1913, 1918)
Ionides, CJP (1912)	
Jackson, FJ (1910, 1913, 1914, 1916)	

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NB: Arthur Loveridge was the mentor of Louis Leakey.

END